US EPA Stormwater Webcast

Stormwater and TMDLs: Making the Connection

An Introductory Workshop for Phase II MS4 Permittees in Florida

Wednesday, April 27, 2011

Speakers:

- Alanna Conley, EPA Region 4
- Barry Tonning,Tetra Tech Inc.
- Eric Livingston, Florida Department of Environmental Protection
- Amy Tracy, Florida Department of Environmental Protection
- Edward Smith, Florida Department of Environmental Protection

Guide to Our Webcasts

- **To Ask a Question – Type your question in the text box located at the bottom of your screen**
- **To Answer Poll Question – Click on the radio button to the left of your choice and click submit. Do not type your answer in the "Ask a Question" box**
- **To See Closed Captioning – Turn your pop-up blocker off and click on the "closed captioning" button**
- **To Complete the Evaluation – Answer questions in the slide window**

What Is A TMDL

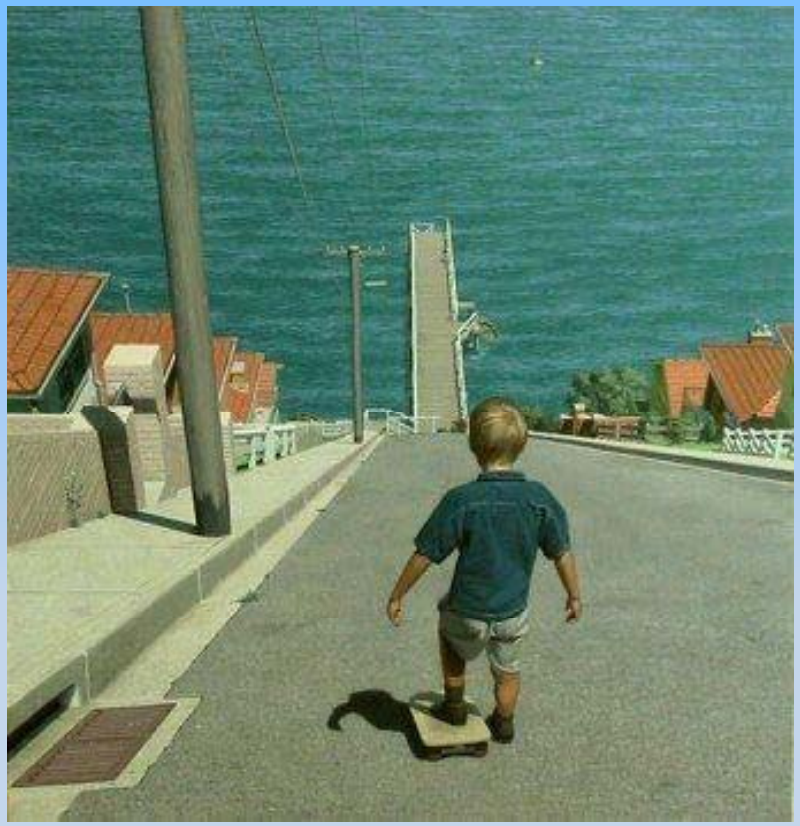
and how does it affect MS4s?

Barry Tonning

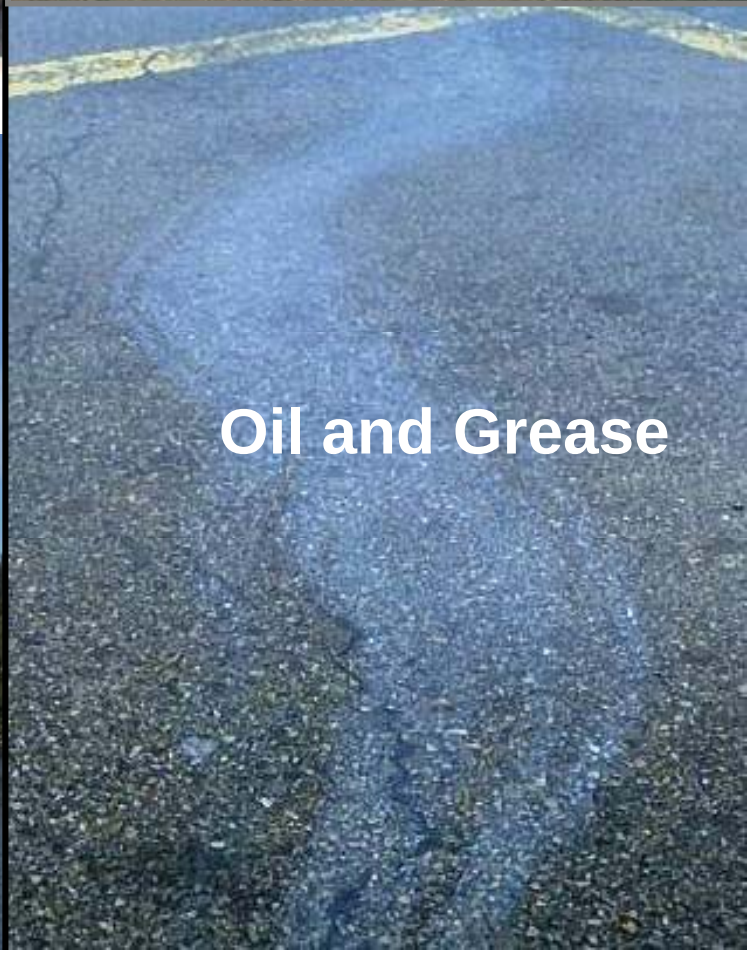
Tetra Tech

Session 1: Topics

- **Urban stormwater pollutants and sources**
- **Water quality standards and regulations**
- **Impaired waters and total maximum daily loads (TMDLs)**
- **Establishing TMDLs**



Polluted runoff from urban areas



Where do the pollutants come from?

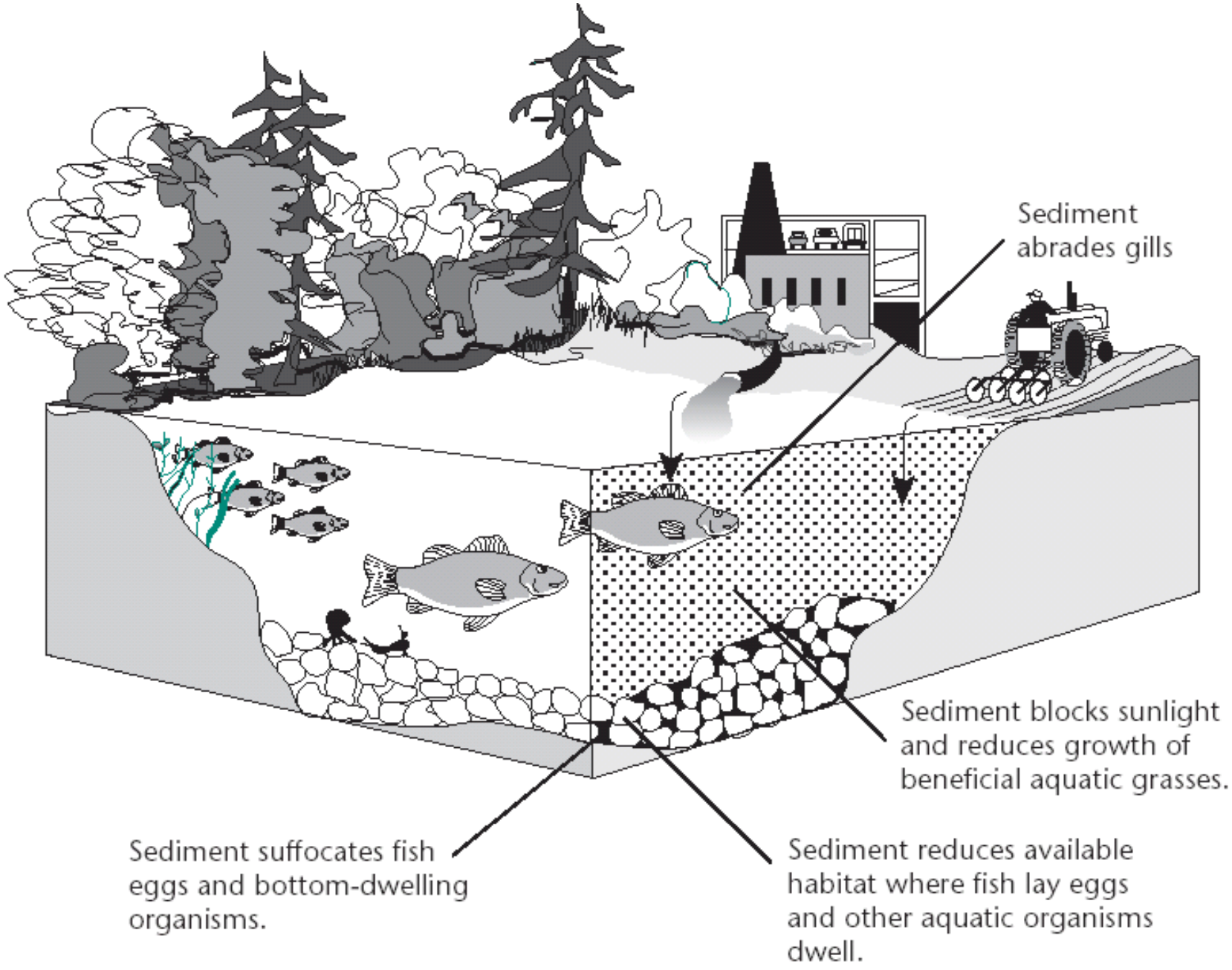
Urban development impacts

- **Pavement, roofs, sidewalks, and other hard surfaces increase runoff & decrease soil infiltration**
  - **Causes downstream channel erosion**
- **Runoff from urban areas contains:**
  - **Oil and grease (from roads, parking lots, truck loading/unloading areas)**
  - **Pesticides, fertilizers, nutrients (from lawns/gardens and landscaped areas)**
  - **Sediment (from stream channel erosion and construction sites)**
  - **Heat (from hard surfaces)**
  - **Bacteria (from pet wastes, septic systems, sewer lines)**
  - **Trash (from roadways, parking lots, commercial areas, etc.)**

Effects of Stormwater Runoff

- **Water quality impacts**
  - **Pollutant runoff**
  - **Stream, river, lake effects**
- **Water quantity impacts**
  - **Increased runoff/reduced infiltration & base flow**
  - **Changes to stream geomorphology**
  - **Impacts to aquatic habitat**

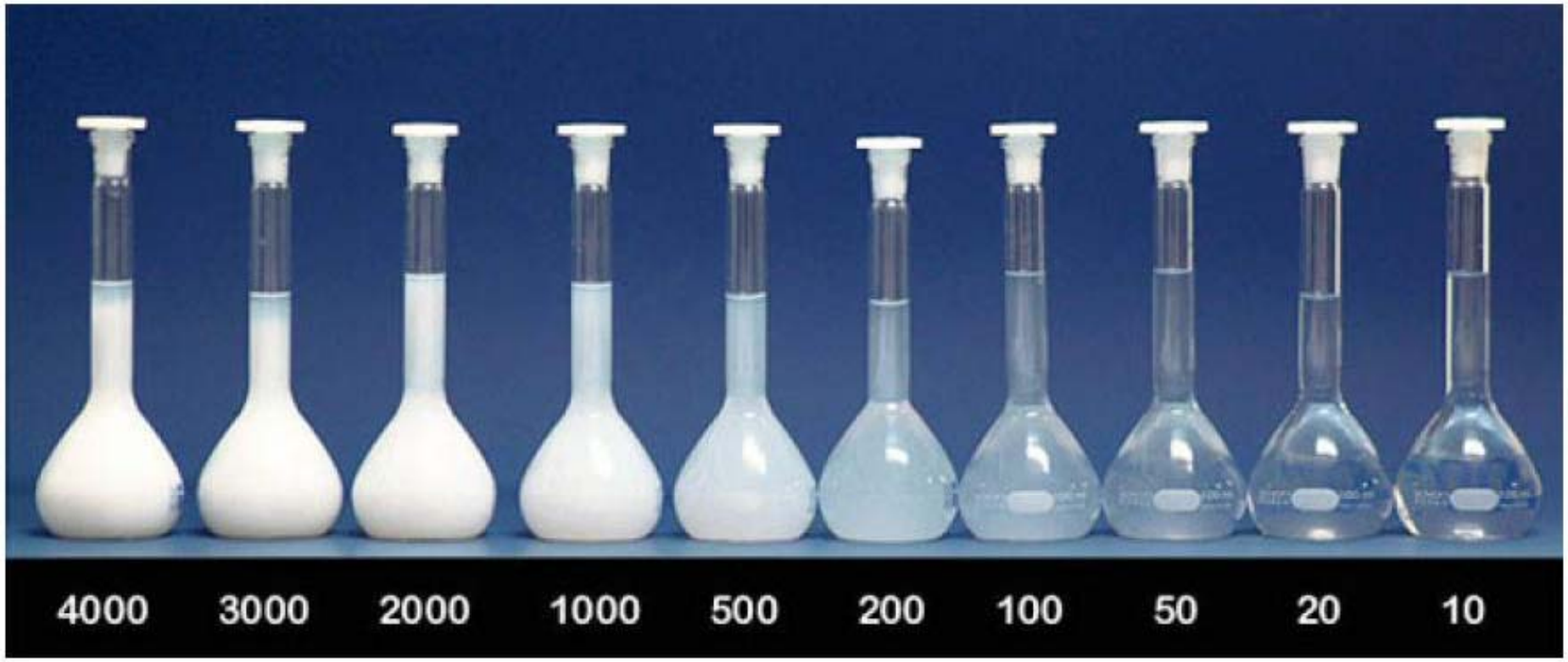
Common stormwater pollutants: sediment



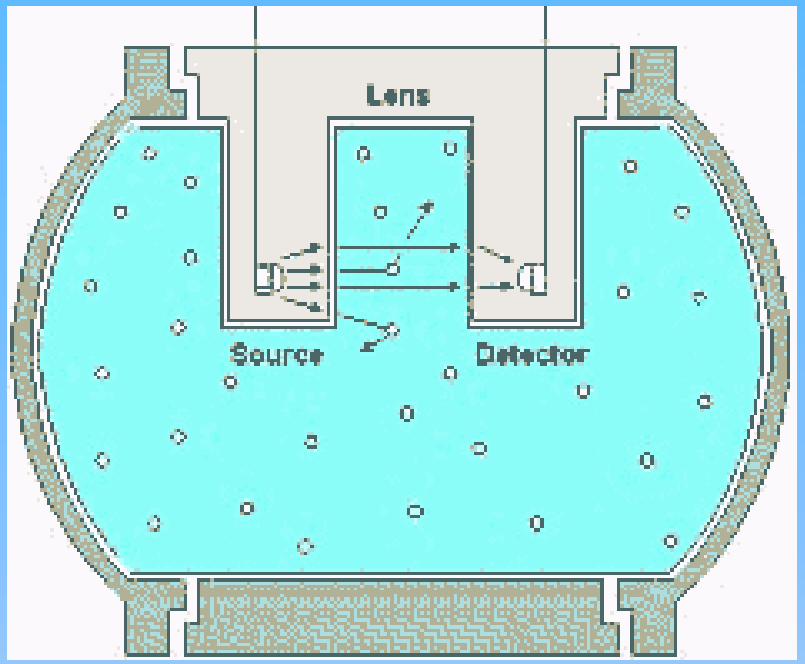
How sediment is measured

- **Total suspended solids: part of sample poured/drawn off & filtered; ~ 0.45 microns (µm) and larger weighed (mg/L) after drying**
- **Suspended sediment concentration: same, but all of sample filtered**
- **Settleable solids: Imhoff cone, 1 hr**
- **Bedload sediment: Scour chains, volumetric estimates**
- **Suspended and bedload sediment: both are added together**

We can also measure water “cloudiness,” or turbidity

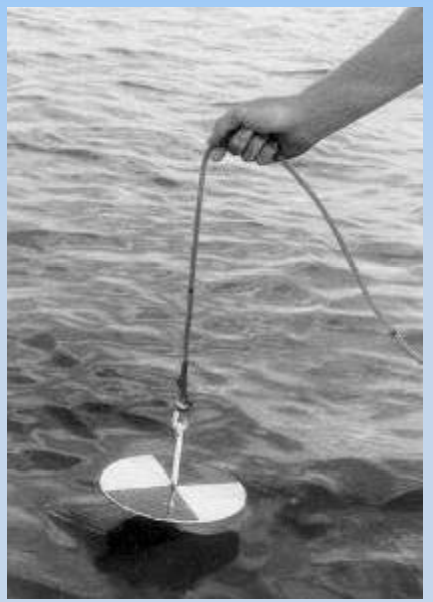


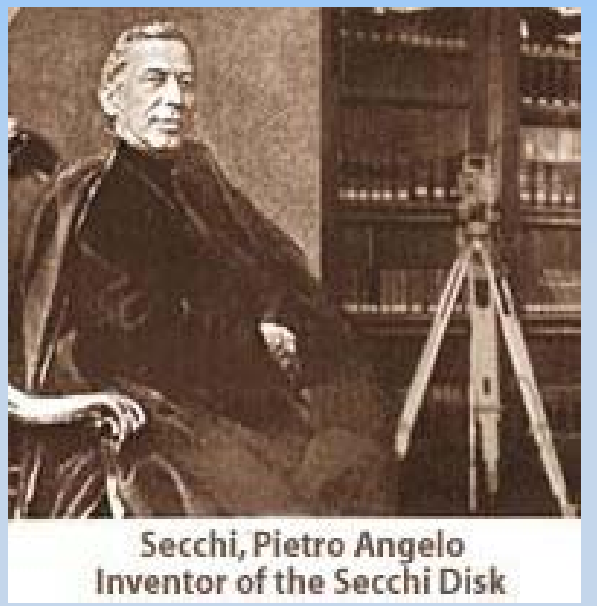
Measured Sample	Measured Value
Waste Water	70-2000 NTU
Final outlet sewage treatment plant	4-20 NTU
Well Water	0.05 - 10 NTU
Potable water	0.05 - 1.5 NTU
Milk	> 4000 NTU
Orange juice	300 - 900 NTU
Primary sludge	6-3%(60 - 30 g/l)
Activated sludge	3-7 g/l
Recirculated sludge	6-8 g/l
Digested sludge	5-8%(50-80 g/l)



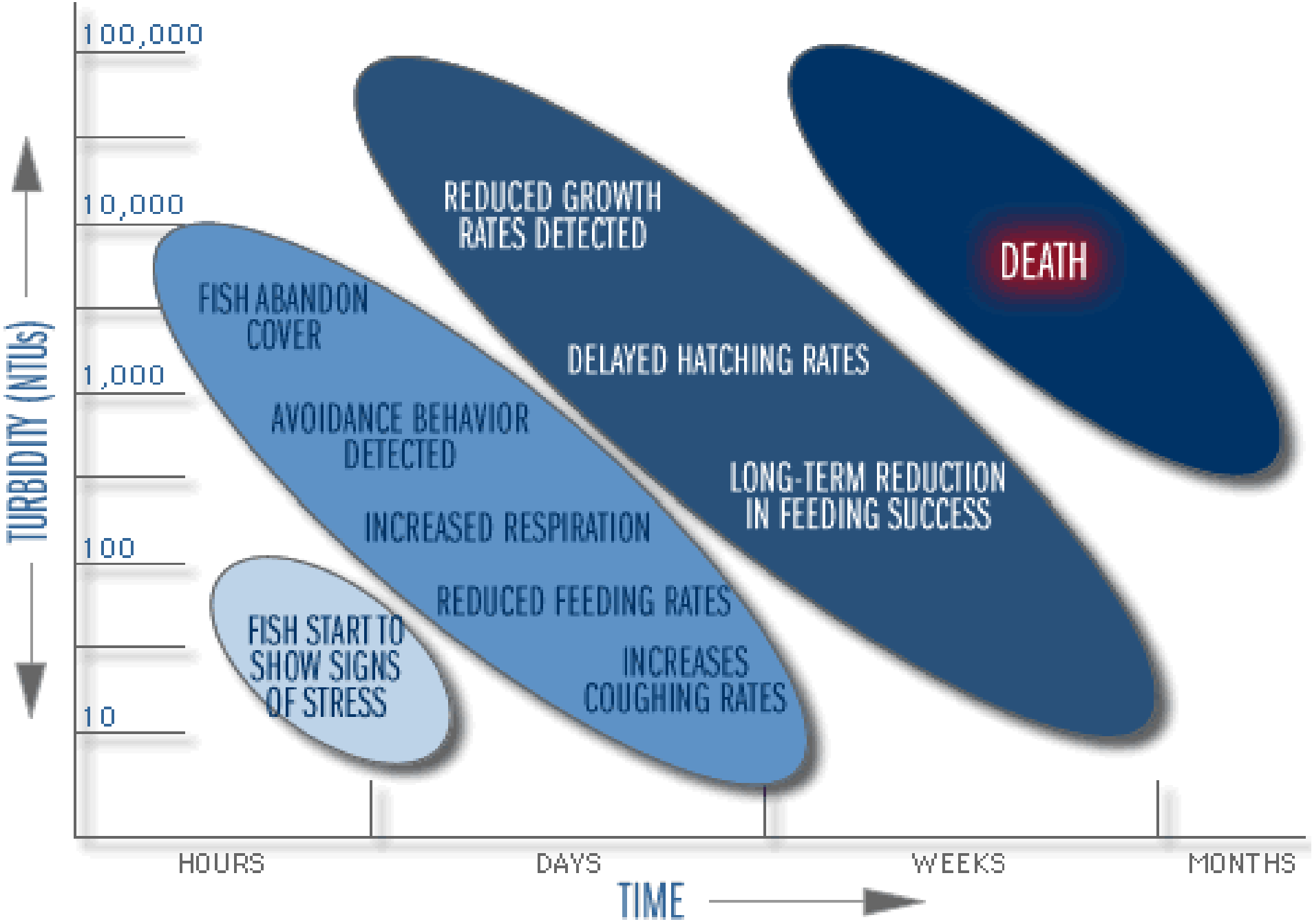
Turbidity meter (above)

Sechhi disk is used to measure “cloudiness” (water clarity) in lakes

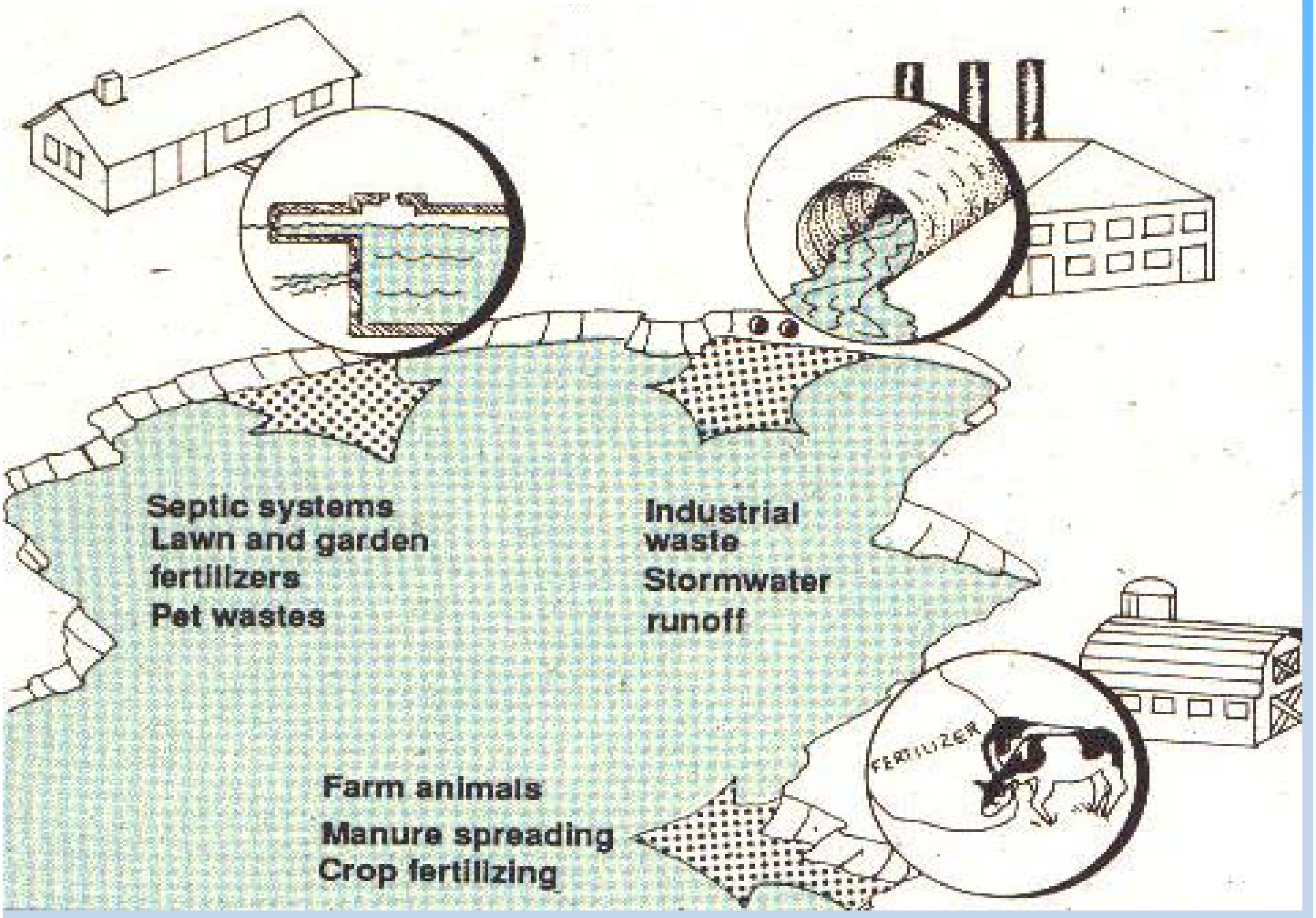




RELATIONAL TRENDS OF FRESH WATER FISH ACTIVITY TO TURBIDITY VALUES AND TIME



Common stormwater pollutants: nutrients



Nutrients

Most inland fresh waters will “bloom” with algae when phosphorus is added.

Bacteria that decompose algae suck dissolved oxygen out of the water, and can lead to fish kills

Nutrients: phosphorus & nitrogen

Lab analysis required

Phosphorus

- **Major concern for inland fresh waters**
- **Sources include wastewater plants (~ 1 – 5 mg/l), runoff from lawns, commercial, industrial areas**
- **Runoff sources: dissolved & particulate**
- **Major portion from cultivated fields (~ 75-90%) is soil-based**

Phosphorus

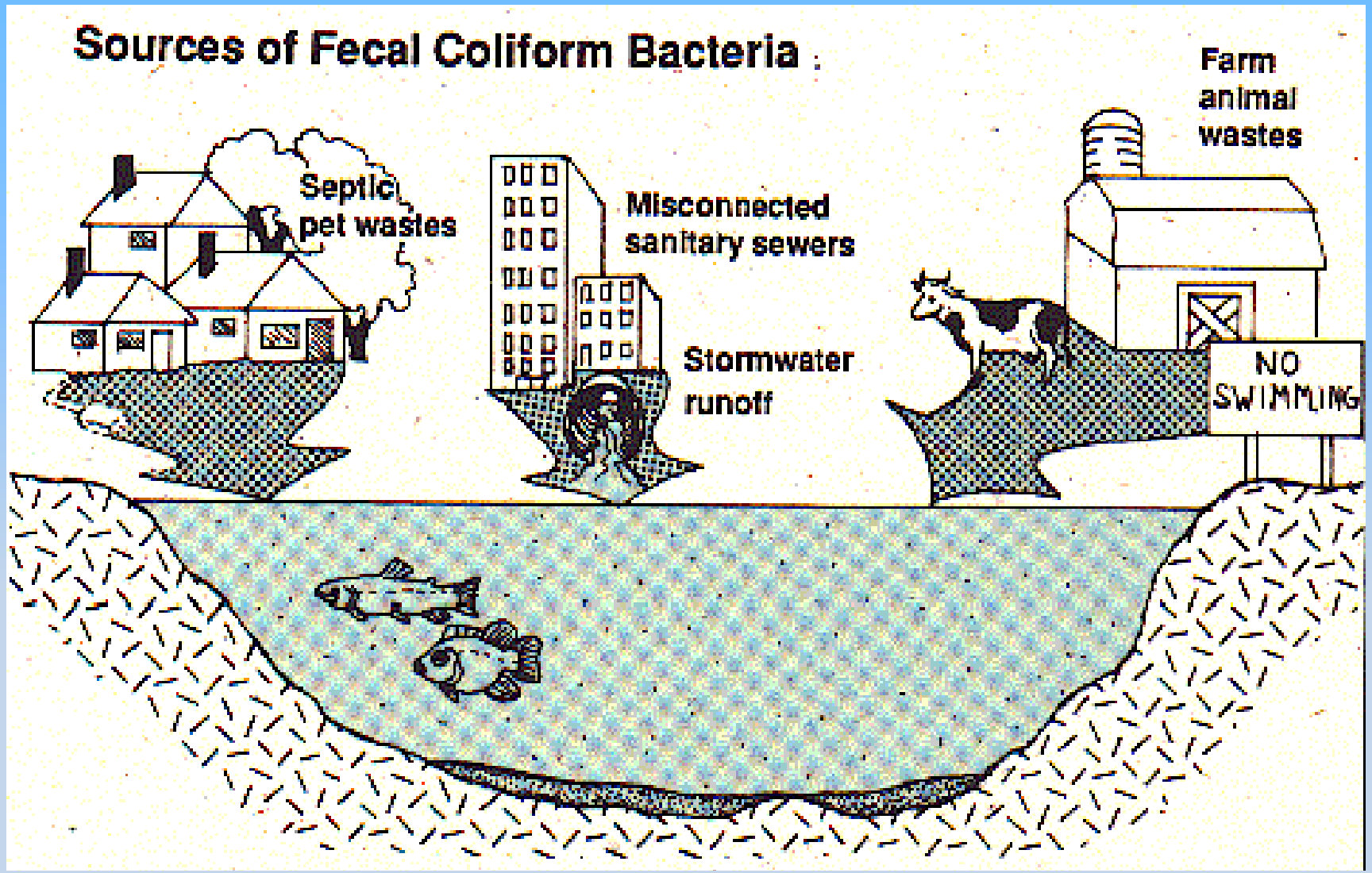
- **Dissolved form is usually less, but is IMMEDIATELY bio-available to algae**
- **Dissolved phosphorus increases in pastures, reduced tillage fields**

- **Concentrations ~ >0.3 mg/l linked to water quality impairment (.05 mg/l for some lakes)**

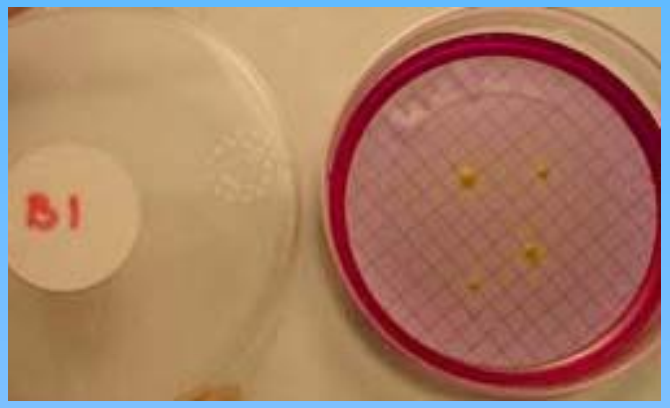
Nitrogen

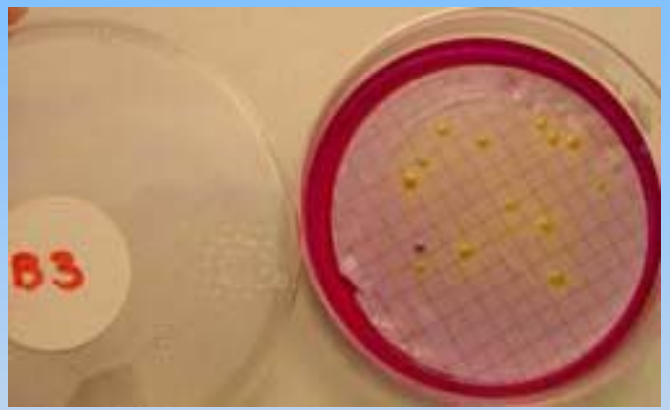
- **Nitrogen measured as nitrate (NO3) plus nitrite (NO2); ammonia/um ($NH3/NH4^+$); TKN (organic N + ammonia/um)**
- **Supports algae growth; mostly a concern in coastal waters and groundwater**
- **Drinking water limit is 10 mg/l (nitrate)**
- **Ammonia toxic at very low (~ .02 - .2 mg/l) concentrations (higher temp & pH = more NH3 ammonia, less $NH4^+$ ammonium)**

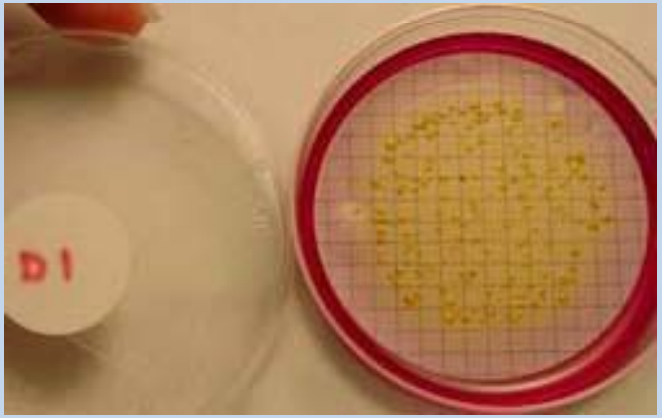
Common stormwater pollutants: bacteria

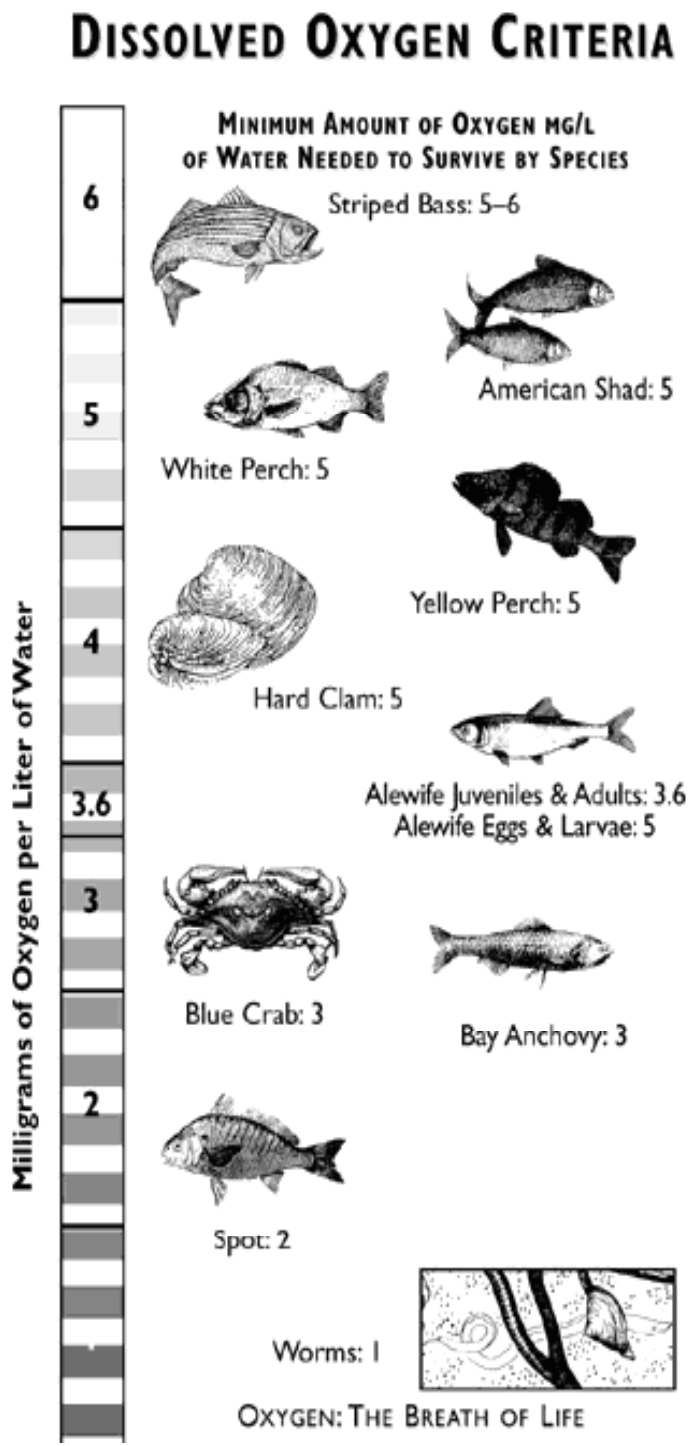


Bacteria – a human health threat. Most programs now measure E. coli bacteria "colony-forming units" per 100 milliliters of raw water





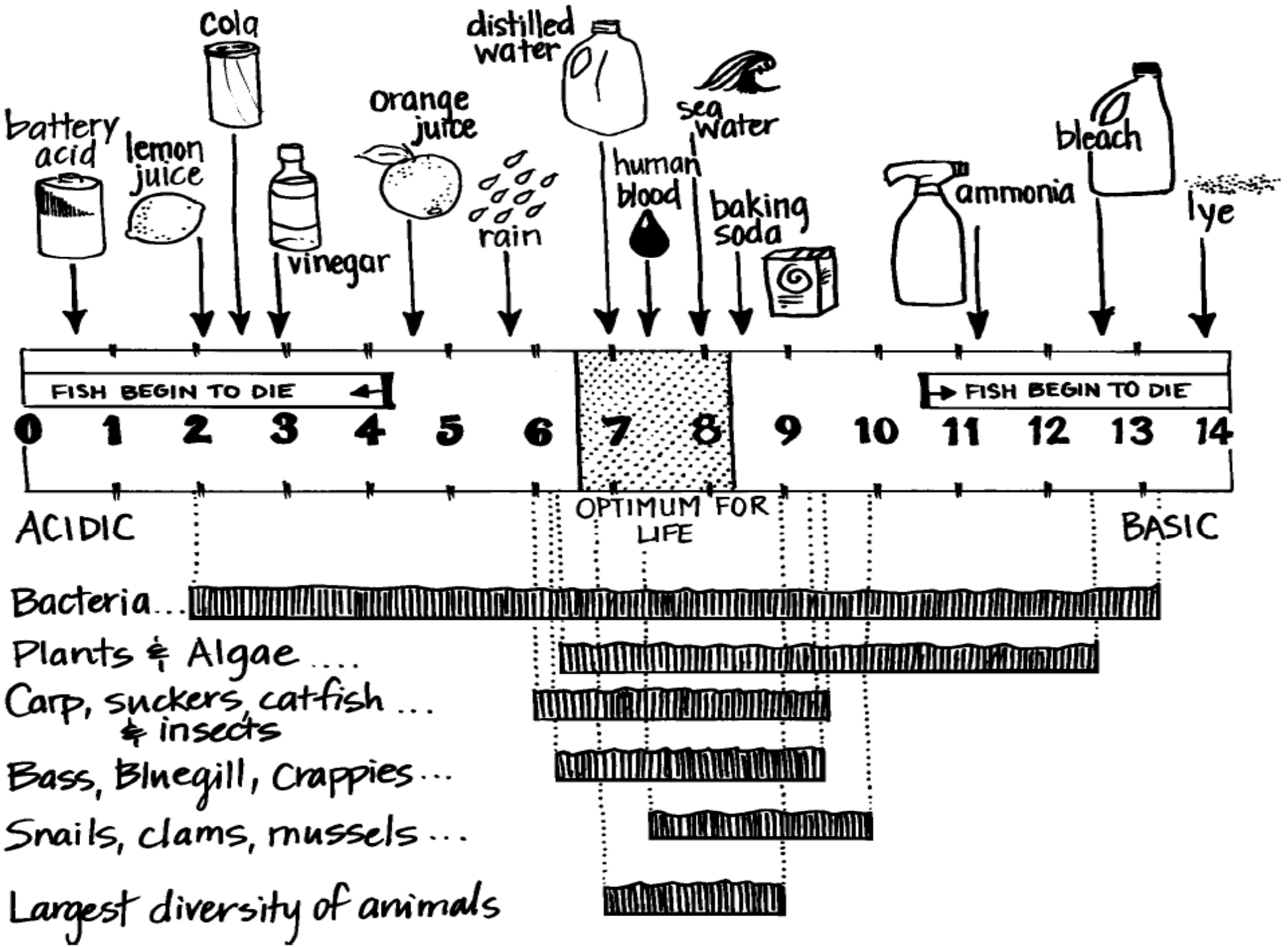


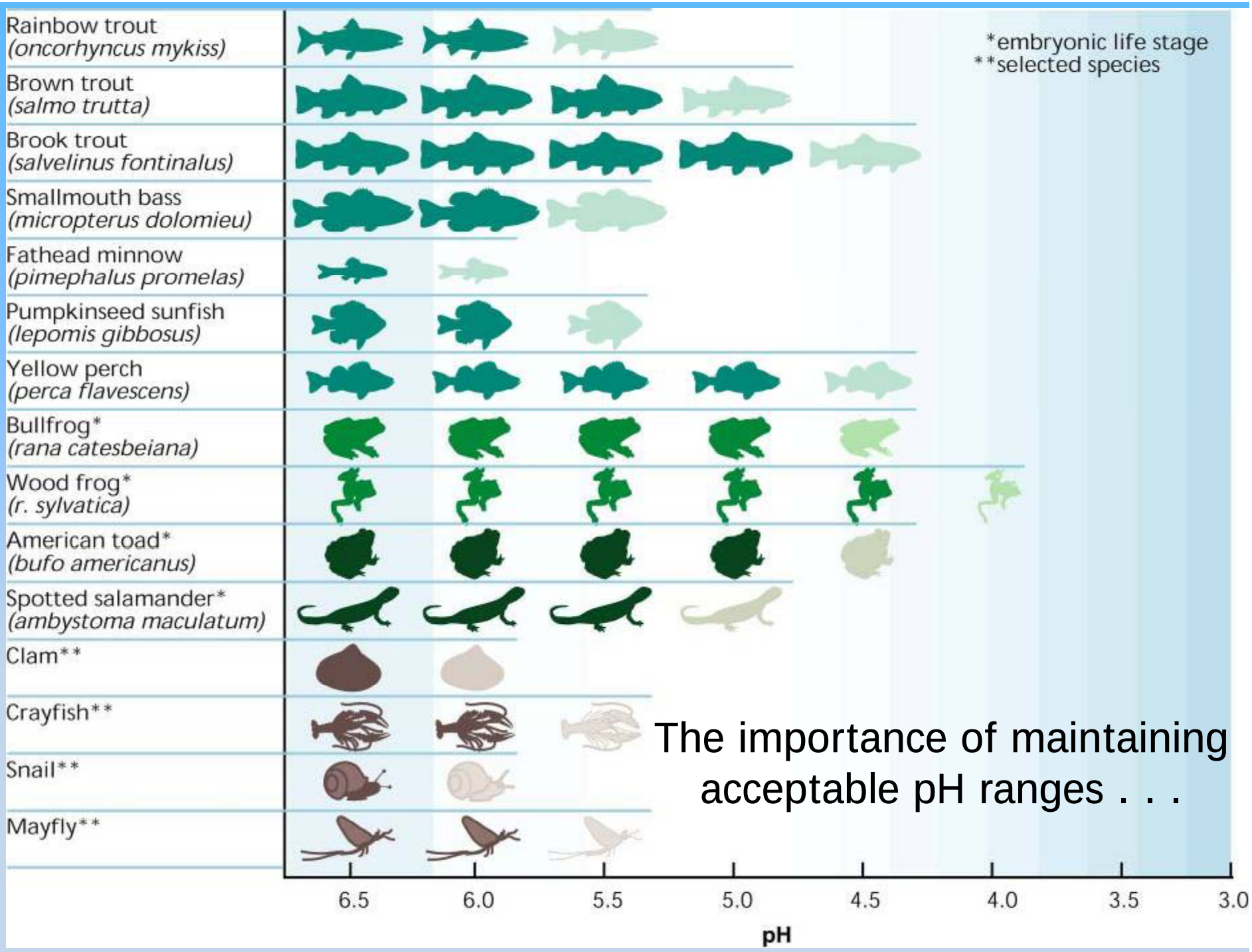


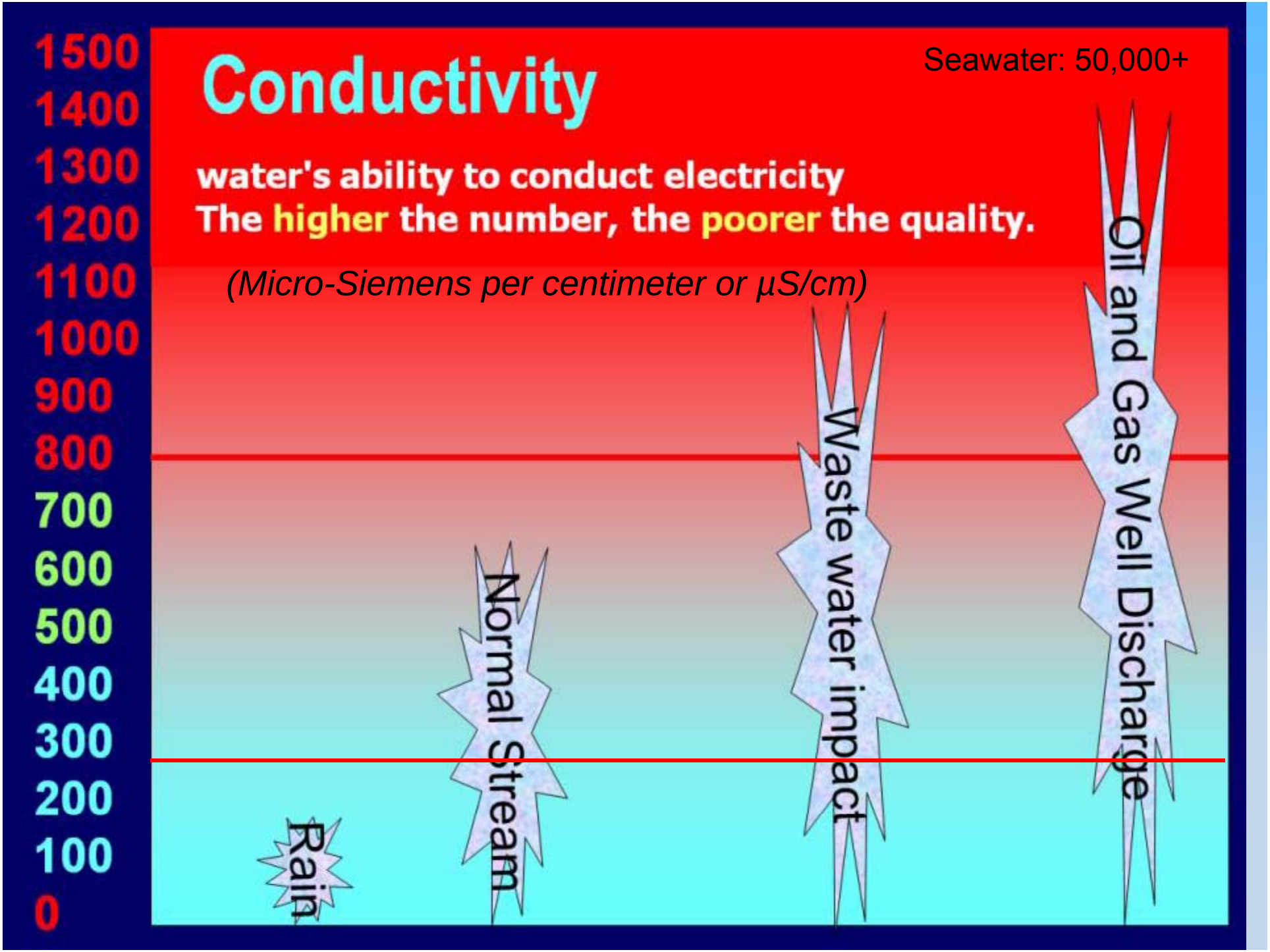
Dissolved oxygen: a key water quality measure

pH: an important parameter!

- Measures hydrogen ion strength
- Indicates acidity or alkalinity
- pH is affected by:
  - Geology (e.g., limestone)
  - Acidic precipitation
  - Disturbances (mine wastes)
  - Polluted runoff
  - Discharges


battery acid
lemon juice
cola
vinegar
orange juice
rain
distilled water
human blood
sea water
baking soda
ammonia
bleach
lye
FISH BEGIN TO DIE
FISH BEGIN TO DIE
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14
ACIDIC
OPTIMUM FOR LIFE
BASIC
Bacteria...
Plants & Algae ....
Carp, suckers, catfish ... & insects
Bass, Bluegill, Crappies...
Snails, clams, mussels...
Largest diversity of animals


Rainbow trout
(oncorhyncus mykiss)
Brown trout
(salmo trutta)
Brook trout
(salvelinus fontinalus)
Smallmouth bass
(micropterus dolomieu)
Fathead minnow
(pimephalus promelas)
Pumpkinseed sunfish
(lepomis gibbosus)
Yellow perch
(perca flavescens)
Bullfrog*
(rana catesbeiana)
Wood frog*
(r. sylvatica)
American toad*
(bufo americanus)
Spotted salamander*
(ambystoma maculatum)
Clam**
Crayfish**
Snail**
Mayfly**
*embryonic life stage
**selected species
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
pH
The importance of maintaining acceptable pH ranges . . .


1500
1400
1300
1200
1100
1000
900
800
700
600
500
400
300
200
100
0
Conductivity
Seawater: 50,000+
water's ability to conduct electricity
The higher the number, the poorer the quality.
(Micro-Siemens per centimeter or µS/cm)
Rain
Normal Stream
Waste water impact
Oil and Gas Well Discharge

Conductivity meter (and you get a thermometer!)

Temperature: different ranges for different biological functions

Species	Max. Weekly Average Temp. for Growth (Juveniles)	Max. Temp. for Survival of Short Exposure (Juveniles)	Max. Weekly Average Temp. for Spawning[a]	Max. Temp. for Embryo Spawning[b]
Common carp			70°F	91°F
Channel catfish	90°F	95°F	81°F	84°F[c]
Largemouth bass	90°F	93°F	70°F	81°F[c]
Rainbow trout	66°F	75°F	48°F	55°F
Smallmouth bass	84°F		63°F	73°F[c]

Metals & other monitoring info is available at the NEMI web site

www.nemi.gov

United States Code, Title 33

Sec. 1251. Congressional declaration of goals and policy

- (a) Restoration and maintenance of chemical, physical and biological integrity of Nation's waters; national goals for achievement of objective

The objective of this chapter is to restore and maintain the chemical, physical, and biological integrity of the Nation's waters. In order to achieve this objective it is hereby declared that, consistent with the provisions of this chapter -

- (1) it is the national goal that the discharge of pollutants into the navigable waters be eliminated by 1985;
- (2) it is the national goal that wherever attainable, an interim goal of water quality which provides for the protection and propagation of fish, shellfish, and wildlife and provides for recreation in and on the water be achieved by July 1, 1983;
- (3) it is the national policy that the discharge of toxic pollutants in toxic amounts be prohibited;
- (4) it is the national policy that Federal financial assistance be provided to construct publicly owned waste treatment works;
- (5) it is the national policy that areawide waste treatment management planning processes be developed and implemented to assure adequate control of sources of pollutants in each State;
- (6) it is the national policy that a major research and demonstration effort be made to develop technology necessary to eliminate the discharge of pollutants into the navigable waters, waters of the contiguous zone, and the oceans; and
- (7) it is the national policy that programs for the control of nonpoint sources of pollution be developed and implemented in an expeditious manner so as to enable the goals of this chapter to be met through the control of both point and nonpoint sources of pollution.

Clean Water Act

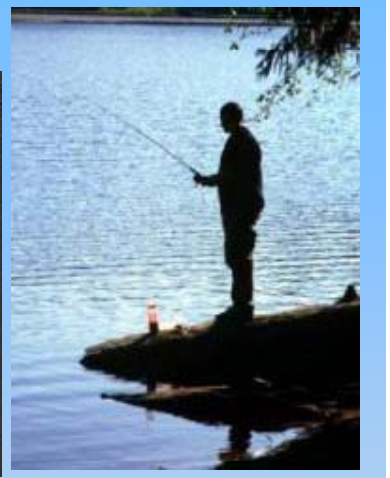
CWA Section 303: Water Quality Standards

- **States' yardstick to measure the health of surface waters**
- **Three key elements of WQSs:**
  - **Designated uses**
  - **Water quality criteria**
  - **Antidegradation policy & implementation methods**

Florida Use Designations

http://www.dep.state.fl.us/water/wqssp/surface.htm

- **Class I - Potable (drinking) Water Supplies**
- **Class II - Shellfish Propagation or Harvesting**
- **Class III - Recreation, Propagation & Maintenance of a Healthy, Well-Balanced Population of Fish & Wildlife**
- **Class IV - Ag Water Supplies**
- **Class V - Navigation, Utility and Industrial Use (none listed now)**



F.A.C. 62-302.400

Class I

St. Johns River and Tributaries - Brevard County Line south through and including Blue Cypress Lake to SR 60.

Class II

Indian River - Indian River County Line south to SR 510 east of the Intracoastal Waterway channel centerline.

Indian River - SR 510 south to an east-west line from the north side of the North Relief Canal.

Indian River - From an east-west line through the northernmost point of Round Island south to county line and east of Intracoastal Waterway centerline.

32. Jackson County

Class I

Econfina Creek - Bay County Line to source.

33. Jefferson County

Class II

Coastal Waters - Within the county, excluding the mouth of Aucilla River.

34. Lafayette County - none.

35. Lake County - none.

36. Lee County

Class I

Caloosahatchee River - E. Lee County Line to South Florida Water Management District Structure 79.

Class II

Charlotte Harbor.

Matanzas Pass, Hurricane Bay, and Hell Peckish (Peckney) Bay - From San Carlos Bay to a line from Estero Island through the southernmost tip of the

Outstanding State Resource Waters (F.A.C. 62-302.700)

(2) A complete listing of Outstanding Florida Waters and Outstanding National Resources Waters is provided in subsections (9) and (10). Outstanding Florida Waters generally include the following surface waters (unless named as Outstanding National Resource Waters):

(a) Waters in National Parks, Preserves, Memorials, Wildlife Refuges and Wilderness Areas;

(b) Waters in the State Park System and Wilderness Areas;

(c) Waters within areas acquired through donation, trade, or purchase under the Environmentally Endangered Lands Bond Program, Conservation and Recreation Lands Program, Land Acquisition Trust Fund Program, and Save Our Coast Program;

(d) Rivers designated under the Florida Scenic and Wild Rivers Program, federal Wild and Scenic Rivers Act of 1968 as amended, and Myakka River Wild and Scenic Designation and preservation Act;

(e) Waters within National Seashores, National Marine Sanctuaries, National Estuarine Research Reserves, and certain National Monuments;

(f) Waters in Aquatic Preserves created under the provisions of Chapter 258, Florida Statutes;

(g) Waters within the Big Cypress National Preserve;

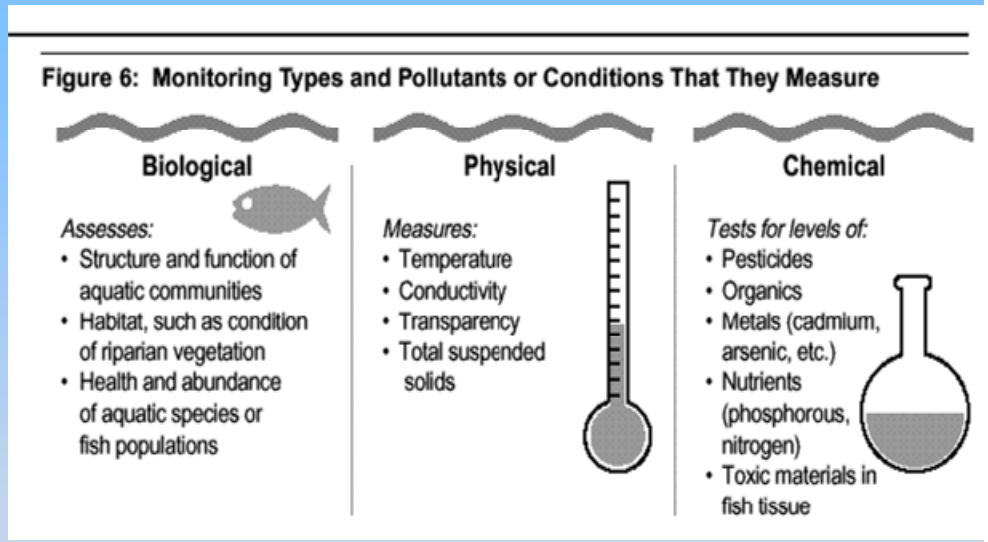
(h) Special Waters as listed in Rule 62-302.700(9)(i); and

(i) Certain Waters within the Boundaries of the National Forests.

(3) Each water body demonstrated to be of exceptional recreational or ecological significance may be designated as a Special Water.

Water Quality Criteria

- **Consistent <u>scientifically</u> with protecting all designated uses (DUs)**
- **Basic types of criteria**
  - **Narrative/numeric**
  - **Water column/sediment/ fish tissue**



- **Criteria apply to:**
  - **Aquatic life**
    - **Pollutant-specific/aquatic community indices**
  - **Human health**
    - **Recreation, drinking, fish consumption**

62-302.530: FL Water Quality Criteria

Parameter	Units	Class I: Potable Water Supply	Class II: Shellfish Propagation or Harvesting	Class III: Recreation, Propagation and Maintenance of a Healthy, Well-Balanced Population of Fish and Wildlife		Class IV: Agricultural Water Sup-plies	Class V: Navigation, Utility, and Industrial Use
				Predominantly Fresh Waters	Predominantly Marine Waters		
(3) Ammonia (un-ionized)	Milligrams/L as NH_3	≤ 0.02		≤ 0.02			
(6) Bacteriological Quality (Fecal Coliform Bacteria)	Number per 100 ml (Most Probable Number (MPN) or Membrane Filter (MF))	MPN or MF counts ≤ monthly avg of 200, can't exceed 400 in 10% of samples, or exceed 800 on any one day. Mo. Avg = geomeans for 5 samples in a 30 day period.	MPN shall not exceed a median value of 14 with not more than 10% of the samples exceeding 43, nor exceed 800 on any one day.	MPN or MF counts shall not exceed a monthly average of 200, nor exceed 400 in 10% of the samples, nor exceed 800 on any one day. Monthly averages shall be expressed as geometric means based on a minimum of 10 samples taken over a 30 day period.			
(11) BOD (Biochemical Oxygen Demand)		Shall not be increased to exceed values which would cause DO to be depressed below the limit established for each class and, in no case, shall it be great enough to produce nuisance conditions.					
(22) Conductance, Specific	Micromhos/cm	Shall not be increased more than 50% above background or to 1275, whichever is greater.		Shall not be increased more than 50% above background or to 1275, whichever is greater.		Shall not be increased more than 50% above background or to 1275, whichever is greater.	Shall not exceed 4,000

Parameter	Units	Class I	Class II	Class III: Fresh	Class III: Marine	Class IV	Class V
(30) Dissolved Oxygen	Milligrams/L	Shall not be less than 5.0. Normal daily and seasonal fluctuations above this level shall be maintained.	Shall not average less than 5.0 in a 24-hour period and shall never be less than 4.0. Normal daily and seasonal fluctuations above these levels shall be maintained.	Shall not be less than 5.0. Normal daily and seasonal fluctuations above these levels shall be maintained.	Shall not average less than 5.0 in a 24-hour period and shall never be less than 4.0. Normal daily and seasonal fluctuations above these levels shall be maintained.	Shall not average less than 4.0 in a 24-hour period and shall never be less than 3.0.	Shall not be less than 0.3, 50% of the time annually for flows $\geq$ 250 cfs, and shall never be less than 0.1. Normal daily and seasonal fluctuations above these levels shall be maintained.
(45) Nitrate	Milligrams/L as N	$\leq$ 10 or that concentration that exceeds the nutrient criteria					
(47) (b) Nutrients		In no case shall nutrient concentrations of a body of water be altered so as to cause an imbalance in natural populations of aquatic flora or fauna.					
(49) (a) Oils and Greases	Milligrams/L	Dissolved or emulsified oils and greases shall not exceed 5.0	Dissolved or emulsified oils and greases shall not exceed 5.0	Dissolved or emulsified oils and greases shall not exceed 5.0	Dissolved or emulsified oils and greases shall not exceed 5.0	Dissolved or emulsified oils and greases shall not exceed 5.0	Dissolved or emulsified oils and greases shall not exceed 10.0
(51) (a) pH (Class I and Class IV Waters)	Standard Units	Shall not vary more than one unit above or below natural background provided that the pH is not lowered to less than 6 units or raised above 8.5 units. If natural background is less than 6 units, the pH shall not vary below natural background or vary more than one unit above natural background. If natural background is higher than 8.5 units, the pH shall not vary above natural background or vary more than one unit below background.					
(53) Phosphorus (Elemental)	Micrograms/L		$\leq$ 0.1		$\leq$ 0.1		

62-302.500 Surface Waters: Minimum Criteria

All surface waters shall at all places and at all times be free from components of discharges which:

1. **Settle to form putrescent deposits or otherwise create a nuisance; or**
2. **Float as debris, scum, oil, or other matter in such amounts as to form nuisances; or**
3. **Produce color, odor, taste, turbidity, or other conditions in such degree as to create a nuisance; or**
4. **Are acutely toxic; or**
5. **Are carcinogenic, mutagenic, or teratogenic to human beings or to certain wildlife/aquatic species, or**
6. **Pose a serious danger to public health, safety, welfare.**

WQS: antidegradation provisions

- **Purpose: Prevent deterioration of existing levels of good water quality**
- **Generally applies parameter-by-parameter**
- **Three tiers of protection**
  - **Tiers 1 – must maintain minimum WQ criteria**
  - **Tier 2 – must prevent degradation of “good” WQ unless you demonstrate ”important” economic or social development in the watershed**
  - **Tier 3 – degradation for ONRWs**

Clean Water Act Section 402

If you discharge:

- **Pollutants (chemical, physical, biological)**
- **From a man-made pipe or conveyance**
- **Into a regulated water body (“water of the U.S.”)**

You must have permit coverage under the National Pollutant Discharge Elimination System (NPDES) - Implemented by most states, including Florida DEP

NPDES Program: Coverage

- **Industrial and municipal wastewater**
- **Industrial, urban, and construction-related storm water runoff**
- **Concentrated animal feeding operations (CAFOs)**
- **Active, inactive, and some abandoned mines**
- **Discharges from some hazardous waste site cleanup/ remediation projects**

Effluent (discharge) limits

- **"Technology-based" end-of-pipe performance standards (concentration/mass)**
  - **BAT, NSPS, PSES, secondary treatment, etc.**
  - **Spelled out in EPA regulation packages (effluent guidelines)**
  - **Use best professional judgment (BPJ) if no EPA regulations**
- **Water quality-based effluent limits (WQBELs - linked to TMDLs)**
  - **Only where technology-based controls are insufficient to meet WQS**
    - **Back-calculated from numeric water quality criteria: pollutant concentrations in discharge**
    - **Derived from narrative criteria: whole effluent toxicity testing; other methods**

Types of Monitoring & Assessments

- **Chemical**
  - **Mostly numeric criteria (DO, pH, conductivity, metals, pesticides, chlorides)**
- **Physical**
  - **Numeric (flow, temperature, habitat structure) or narrative (objectionable color, aquatic habitat**
- **Biological**
  - **Numeric (indices of biological integrity, fecal coliform concentrations, chlorophyll *a*) or narrative (support populations of fish/shellfish)**

So . . . here's what we do . . .

- **Establish water quality goals**
  - Designated uses, water quality criteria
  - Restoration and protection goals
  - Flooding, aesthetics, others???
- **Monitor/ assess inland & coastal waters**
  - Desktop data mining, local monitoring results
  - Watershed, habitat, other assessments
- **Identify key pollutants / stressors**
  - Check against water quality criteria
- **ID or locate pollutant causes/sources**
  - Check pollutants & likely source areas
- **Estimate current pollutant loads**
  - Quantify through empirical, modeling, or other approach

Total Maximum Daily Loads (TMDLs)

A TMDL . . . .

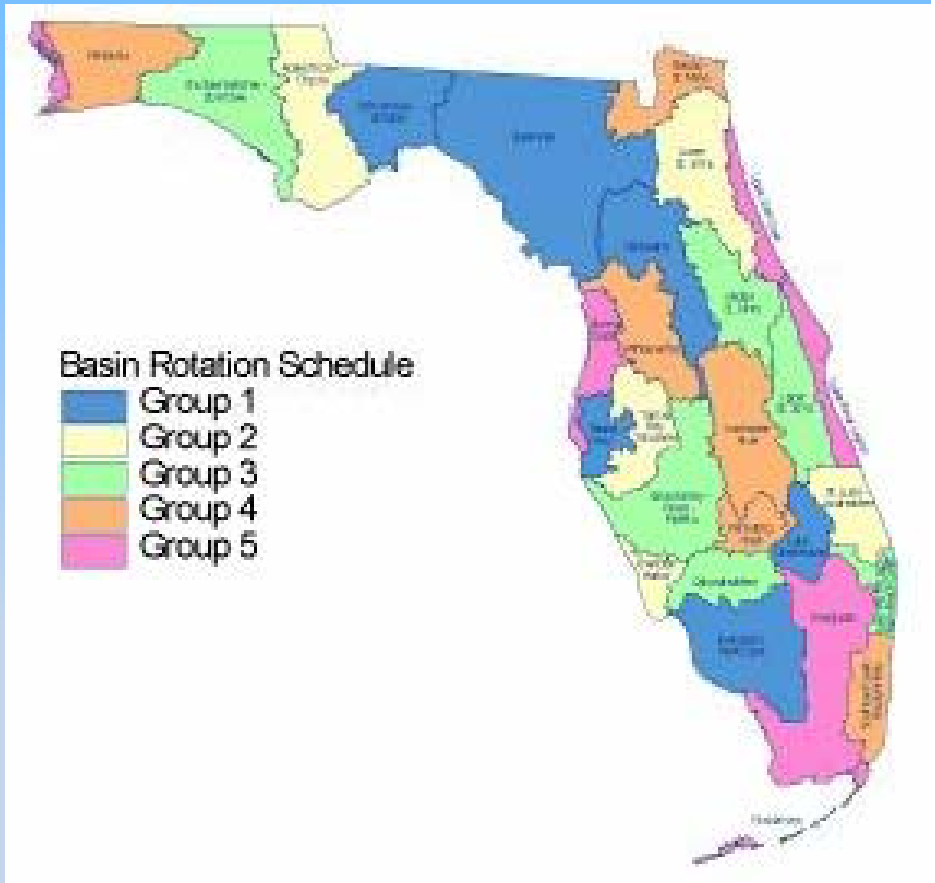
- **Is a strategy for meeting water quality criteria**
- **Quantifies the difference between <u>current</u> pollutant loads and the <u>WQC</u> load**
- **Identifies pollutant sources & relative load contributions**
- **Allocates the load among the various pollutant sources**

TMDLs

- **Required under CWA Sec. 303(d)**
- **Amount of a specific pollutant that a waterbody can receive and assimilate and still meet numeric or narrative water quality criteria**
- **States are required to develop TMDLs for waters not meeting water quality criteria**
- **TMDLs are approved or disapproved by EPA; if disapproved, EPA develops a TMDL**

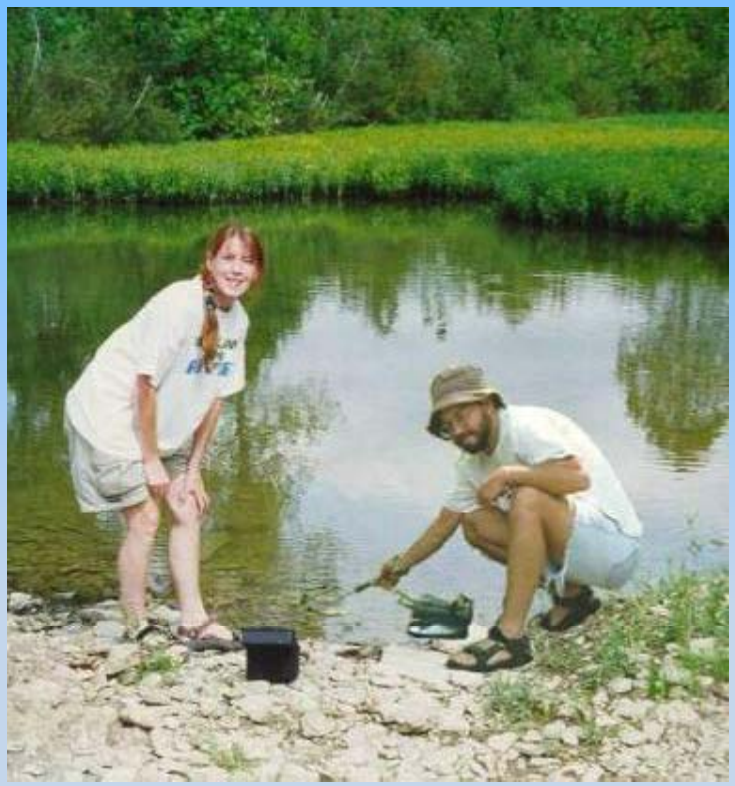
Elements of a TMDL

- **Allowable pollutant load (or "cap")**
- **Allocation of the load among sources**
- **Margin of safety (MOS)**



Total Maximum Daily Loads

- For specific pollutants
  - **Sediment, nitrogen, phosphorus, temperature, copper, mercury**
- For pollutant indicators
  - **BOD, COD, Chlorophyll a**

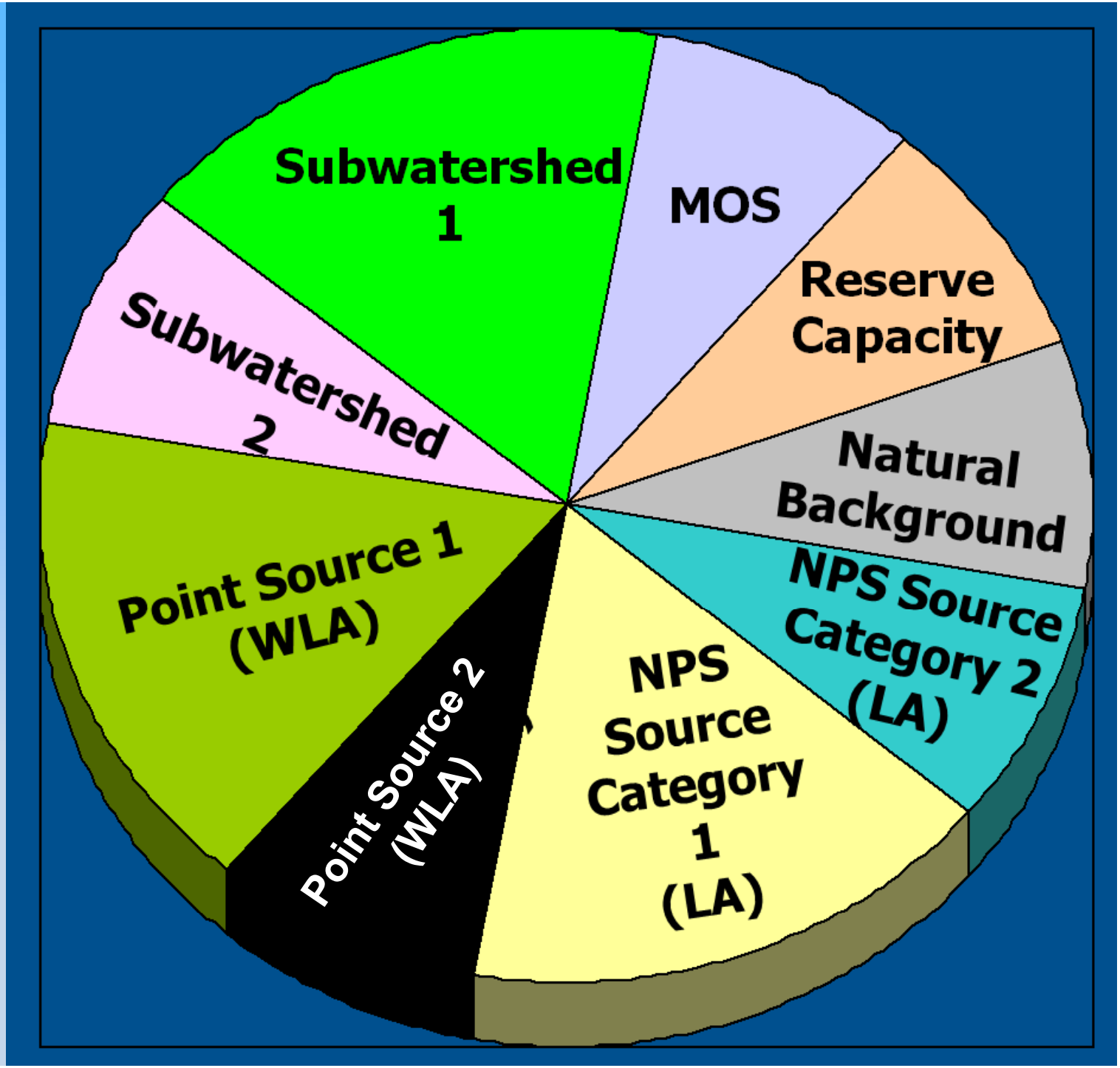


TMDLs: Allocations

- Point sources **with an NPDES permit receive a wasteload allocation (WLA)**
  - **Includes both individual and general NPDES permittees**
- **Individual sources, categories, subcategories of** nonpoint sources **receive a load allocation (LA)**
  - **Row crop and pasture ag, small towns, construction sites < one acre not in regulated MS4s, etc.**

No hard & fast rules on how to allocate

Example pollutant allocation approach



Example Total Maximum Daily Load Allocation for Phosphorus

Impaired Creek	Wasteload Allocation			Load Allocation			MOS	Totals
	Sewage Treatment Plant	Industrial Wastewater Plant	MS4 Stormwater Discharges	Non-MS4 Suburbs	Row Crop Corn Fields	Livestock Pasture Land	Margin of Safety	
Town Creek	100 lbs	15 lbs	85 lbs	75 lbs	150 lbs	50 lbs	84 lbs	**559 lbs**
County Creek	60 lbs	0 lbs	35 lbs	100 lbs	20 lbs	125 lbs	60 lbs	**400 lbs**
Suburb Creek	0 lbs	0 lbs	125 lbs	150 lbs	80 lbs	60 lbs	73 lbs	**488 lbs**
Totals	160 lbs	15 lbs	245 lbs	325 lbs	250 lbs	235 lbs	217 lbs	**1447 lbs**

Summary

- **Surface waters must meet water quality criteria limits, based on the designated use**
- **Those that don’t are listed as “impaired”**
- **TMDLs are developed for impaired waters, based on the problem pollutant(s)**
- **TMDL pollutant reductions are implemented thru NPDES permits and polluted runoff (nonpoint source) measures**

Stormwater and TMDLs: Making the Connection

Eric H. Livingston
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http://www.dep.state.fl.us/water/stormwater/npdes/index.htm

FLORIDA WATERSHED RESTORATION ACT
Section 403.067, F.S.

- **Enacted in 1999, amended in 2005**
- **Gives DEP clear legal authority for TMDLs**
- **Requires "Good Science" - DEP to adopt methodology for determining impaired waters = Impaired Waters Rule (62-303, FAC)**
- **Requires "Public Participation"**
  - **303(d) lists are adopted by DEP secretary**
  - **TMDLs, BMAPs are adopted by rule**
- **Requires "equitable allocation" of load reductions**

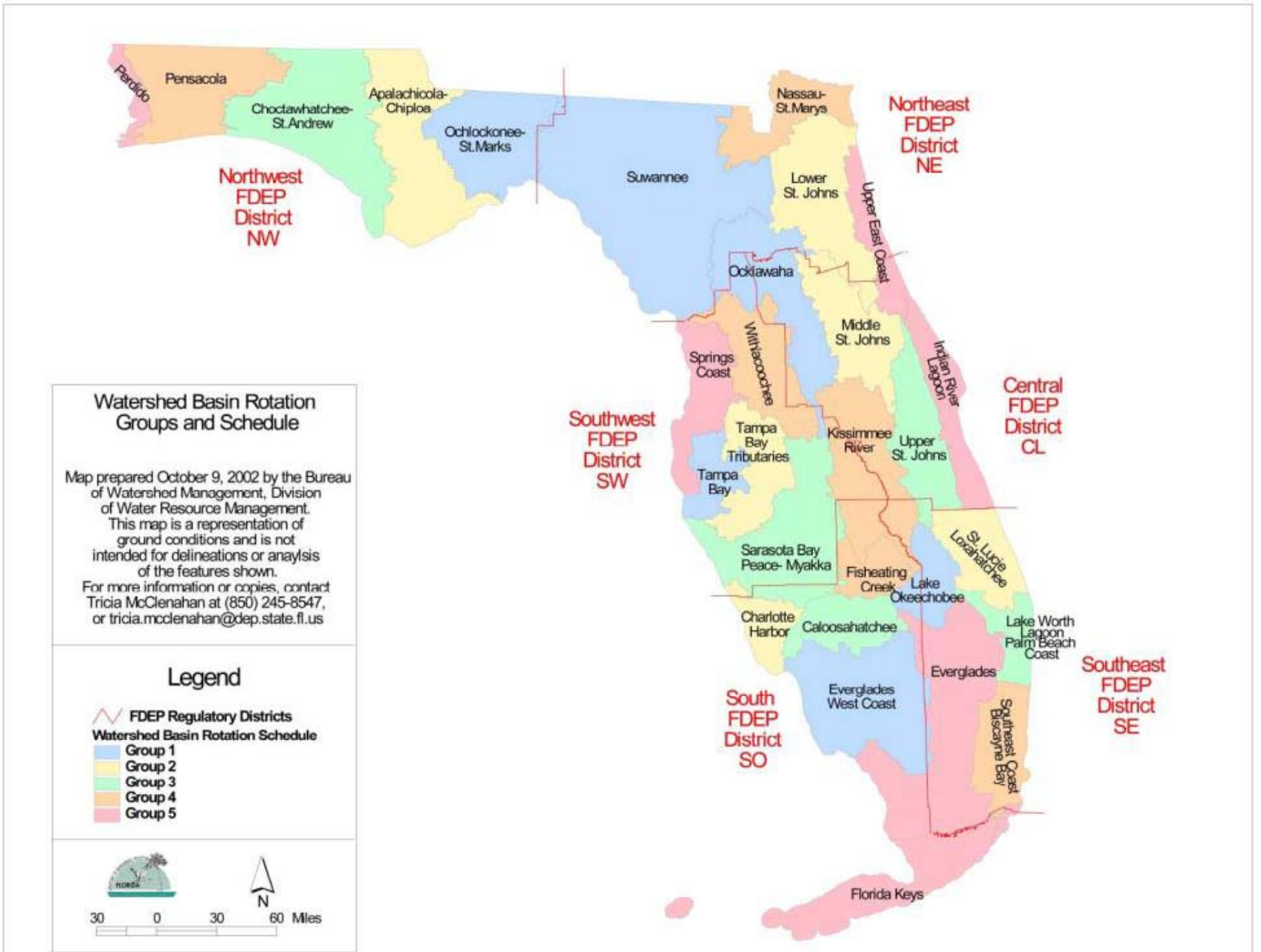
FLORIDA WATERSHED RESTORATION ACT 2005 Amendments – TMDL Implemenation

- **Use existing control programs**
- **Detailed allocation in BMAP**
- **Ag NPS pollution/BMPs – DACS**
- **Urban NPS pollution/BMPs – DEP**
- **Implementation assurances:**
  - **Point sources - NPDES permits**
  - **Municipal stormwater – NPDES MS4**
  - **Agricultural NPS – DACS BMP program**
    – DEP BMAP enforce

FLORIDA WATERSHED RESTORATION ACT 403.067(7)(b), F.S.

Use existing control programs

- **Permitting/regulatory programs**
- **Point sources – WQBELs**
- **Nonregulatory programs (BMPs, cost sharing, P2, 403.061(21) agreements)**
- **SWIM Plans**
- **Water quality credit trading**
- **Public works**
- **Land Acquisition**
- **Everglades Forever Act**


Watershed Basin Rotation Groups and Schedule
Map prepared October 9, 2002 by the Bureau of Watershed Management, Division of Water Resource Management. This map is a representation of ground conditions and is not intended for delineations or anaylsis of the features shown.
For more information or copies, contact Tricia McClenahan at (850) 245-8547, or tricia.mcclenahan@dep.state.fl.us
Legend
FDEP Regulatory Districts
Watershed Basin Rotation Schedule
Group 1
Group 2
Group 3
Group 4
Group 5
30 0 30 60 Miles
N
Perdido
Pensacola
Choctawhatchee-St.Andrew
Apalachicola-Chipola
Ochlockonee-St.Marks
Suwannee
Nassau-St.Marys
Lower St. Johns
Upper East Coast
Ocklawaha
Middle St. Johns
Indian River Lagoon
Withlacoochee
Springs Coast
Tampa Bay Tributaries
Tampa Bay
Kissimmee River
Upper St. Johns
Sarasota Bay Peace- Myakka
Fisheating Creek
Lake Okeechobee
St. Lucie Loxahatchee
Charlotte Harbor
Caloosahatchee
Everglades
Everglades West Coast
Lake Worth Lagoon Palm Beach Coast
Southeast Coast Biscayne Bay
Florida Keys
Northwest FDEP District NW
Northeast FDEP District NE
Southwest FDEP District SW
Central FDEP District CL
South FDEP District SO
Southeast FDEP District SE

THE WATERSHED APPROACH

- Divide watersheds into groups
- Rotate among groups over 5 years
- Five phases of basin cycle
  - Phase 1 - Preliminary basin evaluation
  - Phase 2 - Coordinated basin monitoring
    - ✓ Water quality assessment/verified list
  - Phase 3 - TMDL development
  - Phase 4 - Basin Mgmt Action Plan develop
  - Phase 5 - BMAP implementation

STATUS OF ROTATING BASIN APROACH

DEP District	*Group 1 Basins*	*Group 2 Basins*	*Group 3 Basins*	*Group 4 Basins*	*Group 5 Basins*
NW	Ochlockonee-St. Marks	Apalachicola-Chipola	Choctawhatchee-St. Andrews Bay	Pensacola Bay	Perdido Bay
NE	Suwannee	Lower St Johns		Nassau-St. Marys	Upper East Coast
Central	Ocklawaha	Middle St Johns	Upper St Johns	Kissimmee	Indian River Lagoon
SW	Tampa Bay	Tampa Bay Tributaries	Sarasota Bay-Peace-Myakka	Withlacochee	Springs Coast
S	West Coast	Charlotte Harbor	Caloosahatchee	Fisheating Creek	Florida Keys
SE	Lake Okeechobee	St.Lucie-Loxahatchee	Lake Worth Lagoon- Palm Beach Coast	Southeast Coast Biscayne Bay	Everglades

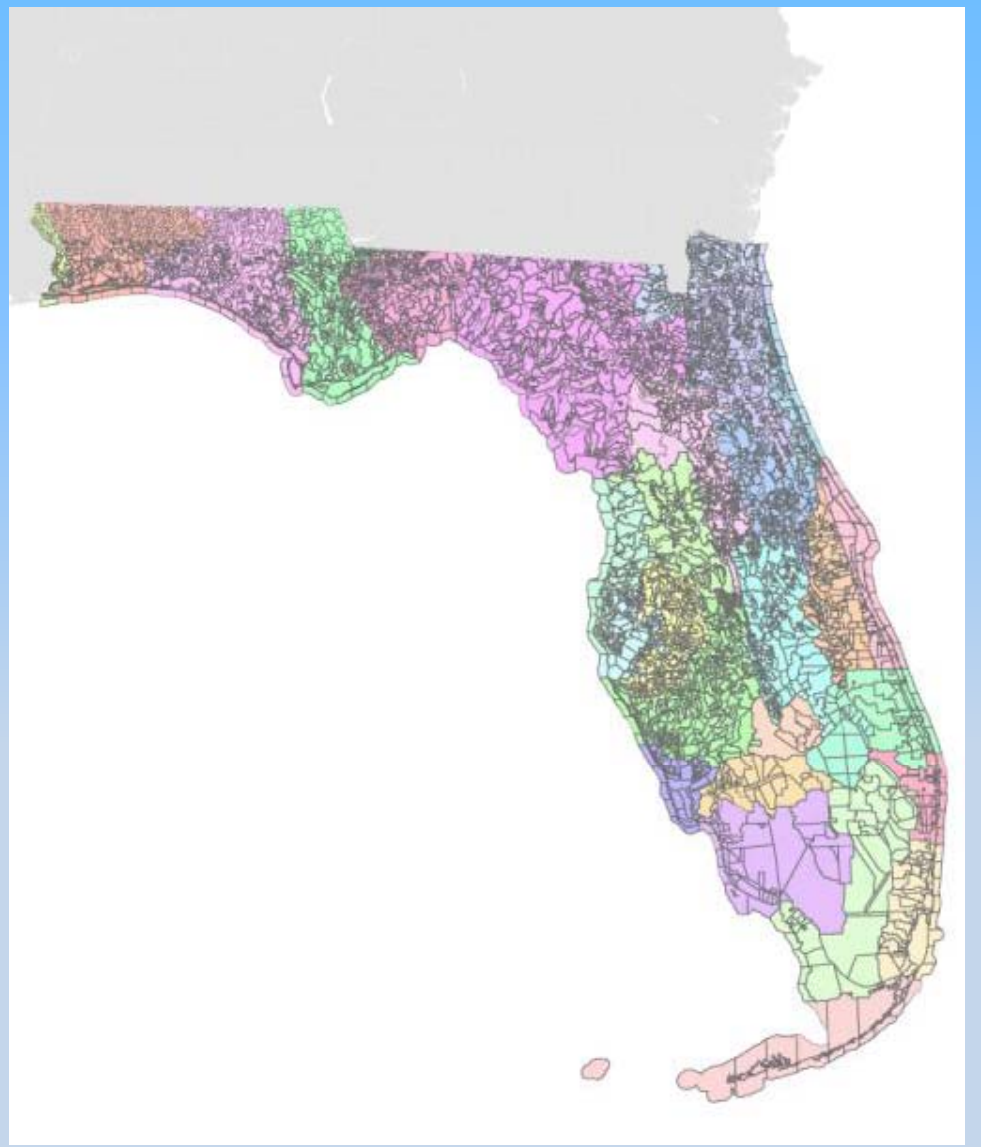
YEAR	05 06 Cycle 2	06 07	07 08	08 09	09 10	10 11 Cycle 3	11 12	12 13	13 14	14 15	15 16 Cycle 4
Group 1	PHASE 1	PHASE 2	PHASE 3	PHASE 4	PHASE 5	PHASE 1	PHASE 2	PHASE 3	PHASE 4	PHASE 5	PHASE 1
Group 2		PHASE 1	PHASE 2	PHASE 3	PHASE 4	PHASE 5	PHASE 1	PHASE 2	PHASE 3	PHASE 4	PHASE 5
Group 3			PHASE 1	PHASE 2	PHASE 3	PHASE 4	PHASE 5	PHASE 1	PHASE 2	PHASE 3	PHASE 4
Group 4				PHASE 1	PHASE 2	PHASE 3	PHASE 4	PHASE 5	PHASE 1	PHASE 2	PHASE 3
Group 5					PHASE 1	PHASE 2	PHASE 3	PHASE 4	PHASE 5	PHASE 1	PHASE 2

WATER QUALITY ASSESSMENT

- **Based on WBIDs**
- **Based on Impaired Waters Rule**
- **Master List**
  - **Category 1, 2 – healthy**
  - **Category 3 – insufficient data**
  - **Category 4 – impaired, no TMDL**
  - **Category 5 – impaired, need TMDL**
- **Verified List of Impaired Waters**
- **Delist List**

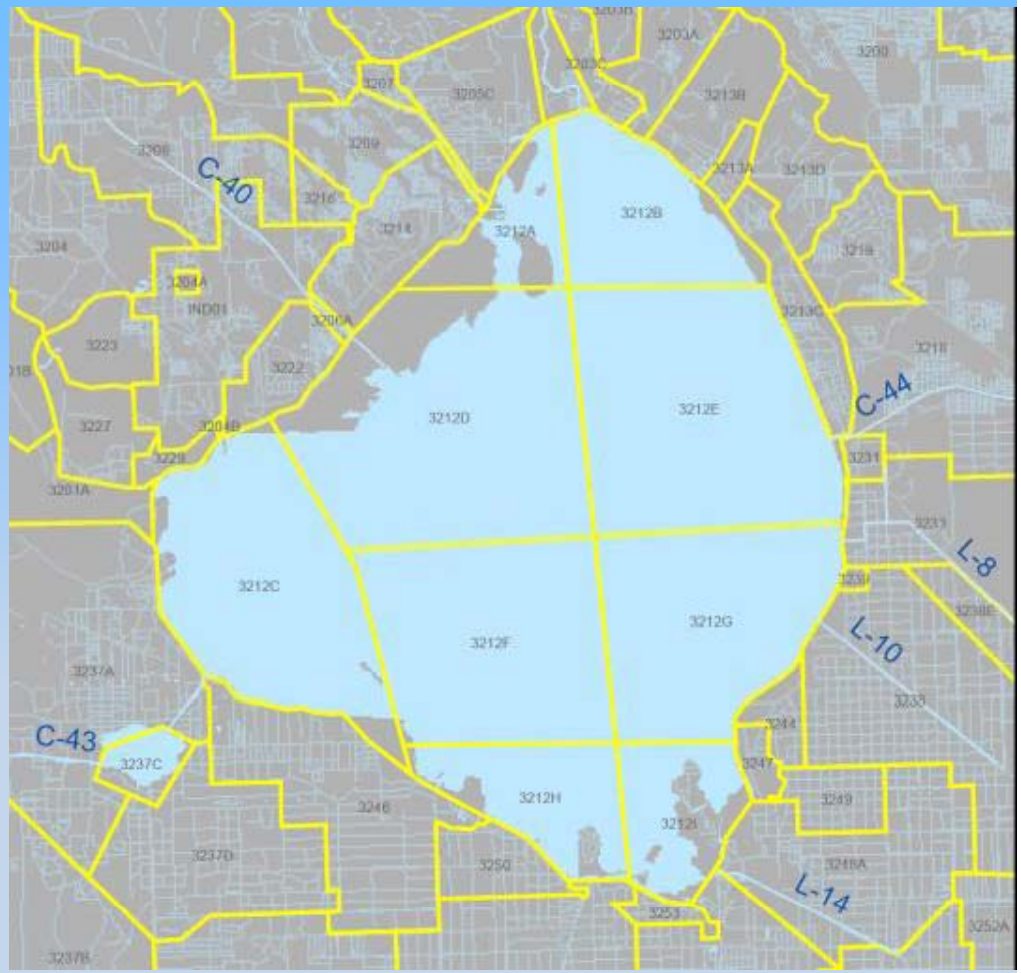
WATER QUALITY ASSESSMENT SCALE

- **TMDLs are developed at the WBID scale**
- **WBID = Waterbody Identification Unit**
- **~6300 WBIDs in Florida**



WBIDs? Watersheds? Waterbodies?

- **Lakes = usually one WBID**
- **Streams/Rivers/Canals = Generally split into WBIDs by reach or segment**
- **WBIDs can also include multiple waterbodies**
- **WBIDs are not the same as watersheds, especially in South Florida!**



FLORIDA'S IMPAIRED WATER RULE
Chapter 62-303, FAC

- **Methodology to statistically analyze data to determine if a water body is impaired**
- **Data from STORET**
- **Planning list (n>10, last ten yrs of data)**
  - **80% statistical confidence**
  - **Basin specific list at start of Phase 1**
- **Verified list (n>20, last 7.5 yrs of data)**
  - **90% statistical confidence**
  - **Basin specific list at end of Phase 2**
  - **Adopted by DEP secretarial order**

FLORIDA'S IMPAIRED WATER RULE

- **Evaluates aquatic life use support**
- **Evaluates biological assessments**
- **Evaluates toxicity**
- **Evaluates nutrients**
- **Evaluates primary contact/recreation**
- **Evaluates fish/shellfish consumption**
- **Evaluates drinking water use and protection of human health**
- **Evaluate "reasonable assurance"**
- **Procedures for delisting waters**

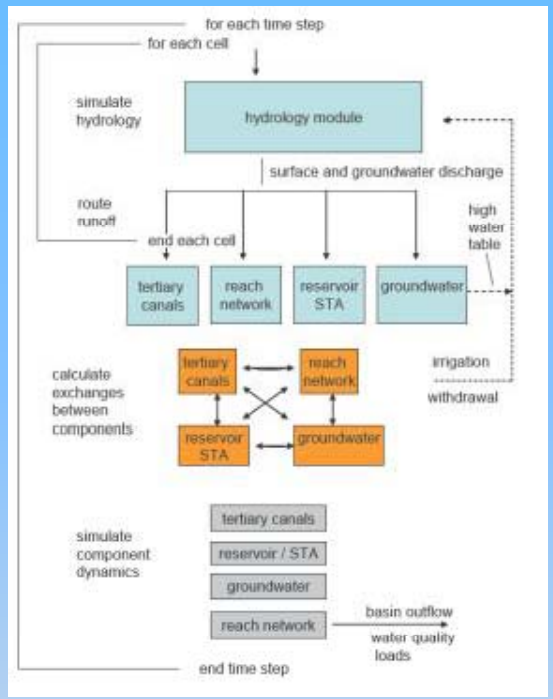
CURRENT STATUS OF IMPAIRED WATERS

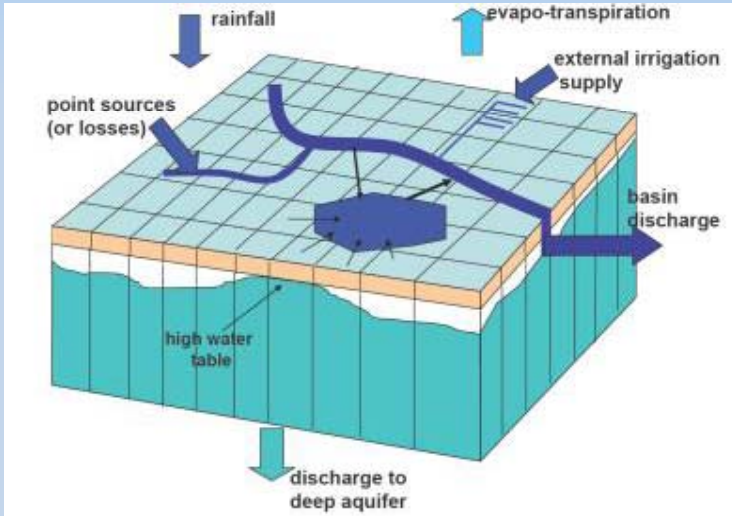
GROUP	# WBIDs	# WBIDS Assessed	Impaired WBIDs	% Impaired	Nutrient Impaired # / %	Bacteria Impaired # / %
1	1769	728	540	74%	144/31	151/37
2	1662	845	995	63%	215/38	197/37
3	1274	699	468	67%	136/38	116/31
4	1097	553	233	42%	39/14	46/17
5	605	437	391	89%	47/23	90/43
Total	6407	3262	2163	66%	581/31	600/33

Total Impairments = 3615 of 19,365 assessments

TMDL DEVELOPMENT GOAL

- **Many ways to set**
  - **Statistical models**
  - **Reference sites**
  - **Modeling**
- **Watershed/waterbody models**
  - **Some are simple (spreadsheet)**
  - **Some are very complex (hydrodynamic models)**
  - **Level of detail and quality of the analysis depend on available data**
- **Consent decree timeframes limit use of models**



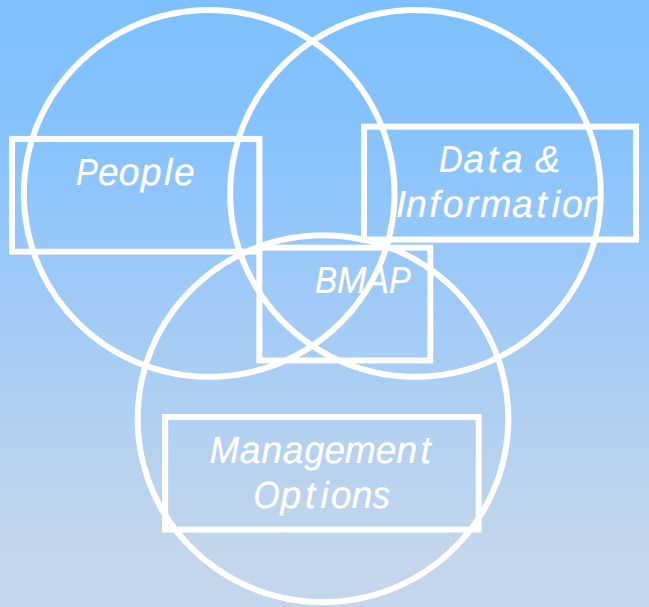


TMDL ALLOCATIONS
SHARING THE PAIN

- **TMDL - max. amount of pollutant loading that can be discharged to a healthy water body**
- **TMDL = WLA + LA + MOS**
- **WLA = Wasteload Allocation = point source allowable load**
- **LA = Load Allocation = nonpoint source allowable load**
- **% reduction = required load reduction to meet WLA or LA**

BASIN MANAGEMENT ACTION PLAN BASICS

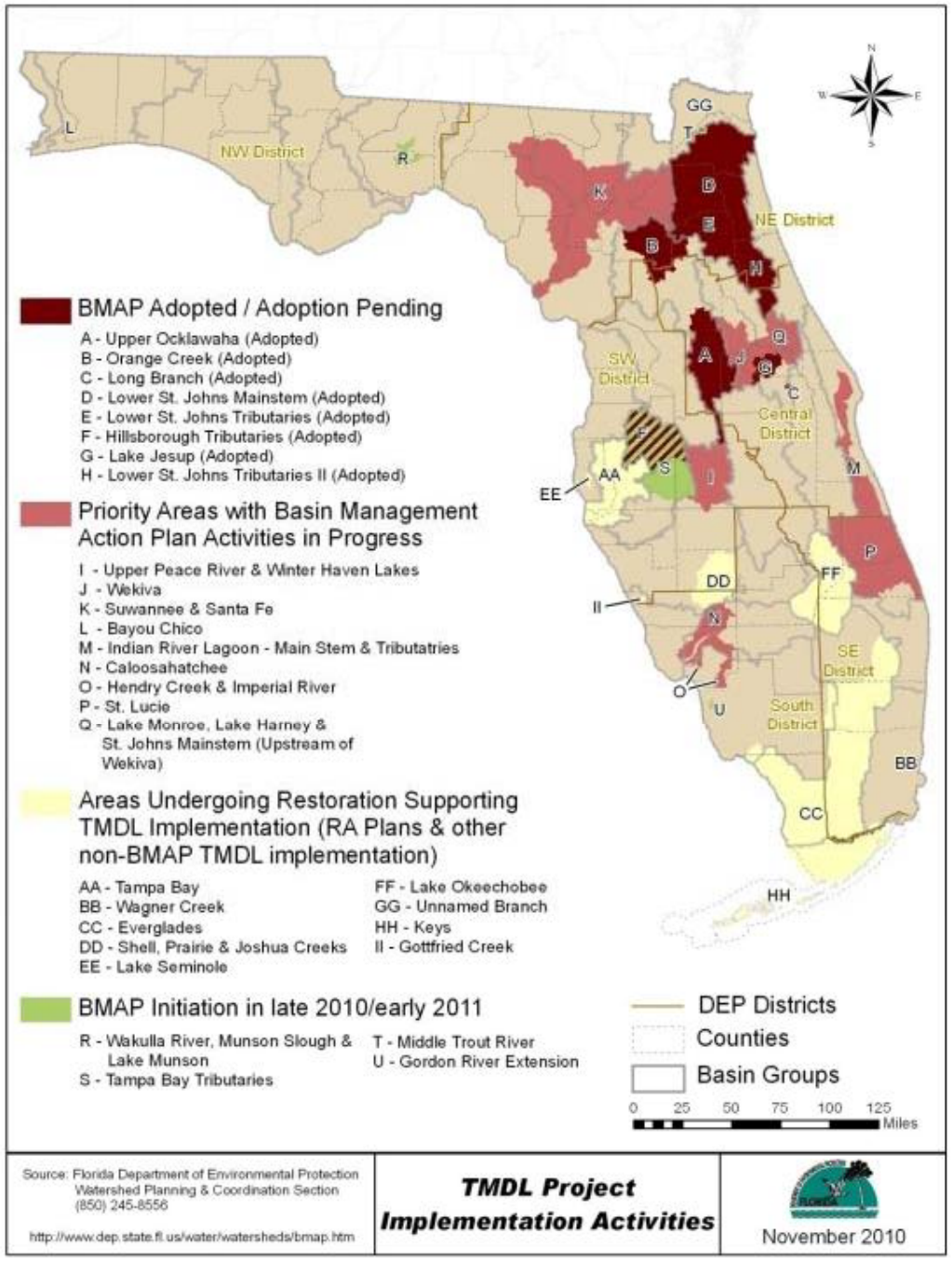
- **Refined source identification**
- **Allocations**
- **Management strategies**
- **Funding**
- **Monitoring (water quality)**
- **Tracking (project implementation)**



ADAPTIVE MANAGEMENT

BMAP ADOPTION

WATER BODY	IMPAIRMENTS	DATE ADOPTED
Upper Ocklawaha	Nutrients in chains of lakes	August 2007
Orange Creek	Nutrients	May 2008
Long Branch	Fecal coliform, nutrients	May 2008
Lower St Johns	Nutrients, DO	October 2008
Hillsborough River	Fecal coliform in six tribs	October 2009
LSJ Tribs I	Fecal coliform in 10 tribs	December 2009
Lake Jesup	Nutrients	May 2010
LSJ Tribs II	Fecal coliform in 15 tribs	August 2010



TMDL Implementation

BMAP Development

FOCUS ON REDUCING NUTRIENT LOADS

- **Low impact design BMPs**
- **Turf grass research project**
- **Florida friendly landscaping program**
  - **Florida Yards & Neighborhoods**
  - **FYN Builder/Developer**
  - **Green Industry BMP program**
  - **Model FFL landscape ordinance**
  - **Urban turf fertilizer labeling rule**
- **Irrigation standards**
- **Golf course BMP manual**
- **Passive nutrient septic tank project**
- **Ag/urban nutrient mgmt BMPs**
- **Unified stormwater treatment rule**

PART TWO

FLORIDA PHASE II MS4 PERMIT REQUIREMENTS AND EVOLUTION

FLORIDA PHASE II MS4 LEGAL FOUNDATION

- **402(p)(6) Federal Clean Water Act**
- **403.0885, Florida Statutes**
- **62-621.300(7), F.A.C.**
- **Generic Permit for Discharge of Stormwater from Phase II MS4s**

FLORIDA PHASE II MS4 PERMIT REQUIREMENTS

- **Six minimum control measures**
  - **Public education**
  - **Public involvement/participation**
  - **Illicit discharge detection/elimination**
  - **Construction site stormwater controls**
  - **Post-construction stormwater controls**
  - **Pollution prevention/good housekeeping**
- **BMPs/measurable goals for each measure**
- **Tracking and record keeping**
- **Evaluation and assessment**
- **Annual report submittal**

FLORIDA PHASE II MS4 PERMIT REQUIREMENTS

- **Part V Compliance with WQS**
  - **Reduce stormwater loadings to the Maximum Extent Practicable (MEP)**
  - **Total Maximum Daily Loads**
    - **Meet obligations in adopted BMAPs**
    - **Adjust SWMP to meet load reductions**
- **Adaptive management**
  - **SWMP adjusted based on annual evaluation of its effectiveness**
  - **SWMP becomes more robust**

FLORIDA WATERSHED RESTORATION ACT 403.067(7)(b), F.S.

Use existing control programs

- **Permitting/regulatory programs**
- **Point sources – WQBELs**
- **Nonregulatory programs (BMPs, cost sharing, P2, 403.061(21) agreements)**
- **SWIM Plans**
- **Water quality credit trading**
- **Public works**
- **Land Acquisition**
- **Everglades Forever Act**

STRUCTURAL BMPs

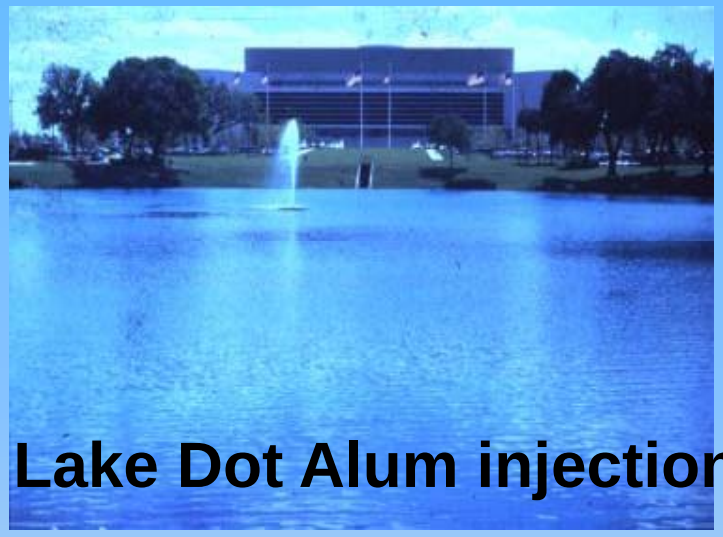
- Regional retrofits
- Enhance existing
  - Floating wetlands
  - SW harvesting

NONSTRUCTURAL BMPs

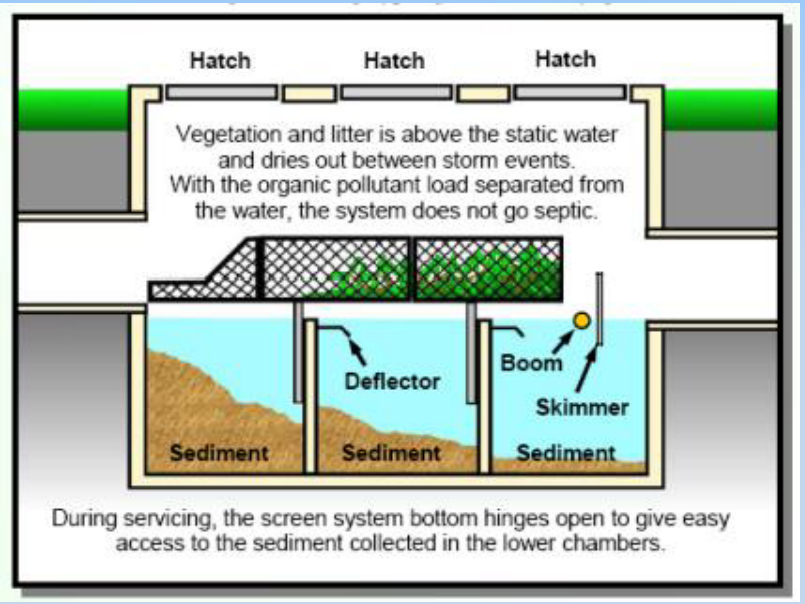
- Low impact design
  - Minimize clearing
  - Protect vegetation
  - Minimize imperviousness
  - Pervious pavements
  - Greenroof/cistern
- Florida-friendly landscaping
- Street sweeping
- Enhanced OM
- Roof runoff to lawns
- Public education

STORMWATER RETROFITTING IN FLORIDA

Greenwood Wetland



Lake Dot Alum injection



Baffle Boxes

Packed bed wetland

LID - THE SOLUTION IS GOING BACK TO THE FUTURE

- **Minimum clearing**
- **Off-grade house**
- **Native vegetation**
- **Cistern under house**
- **No DCIA**

POGO GOT IT RIGHT IN 1971!

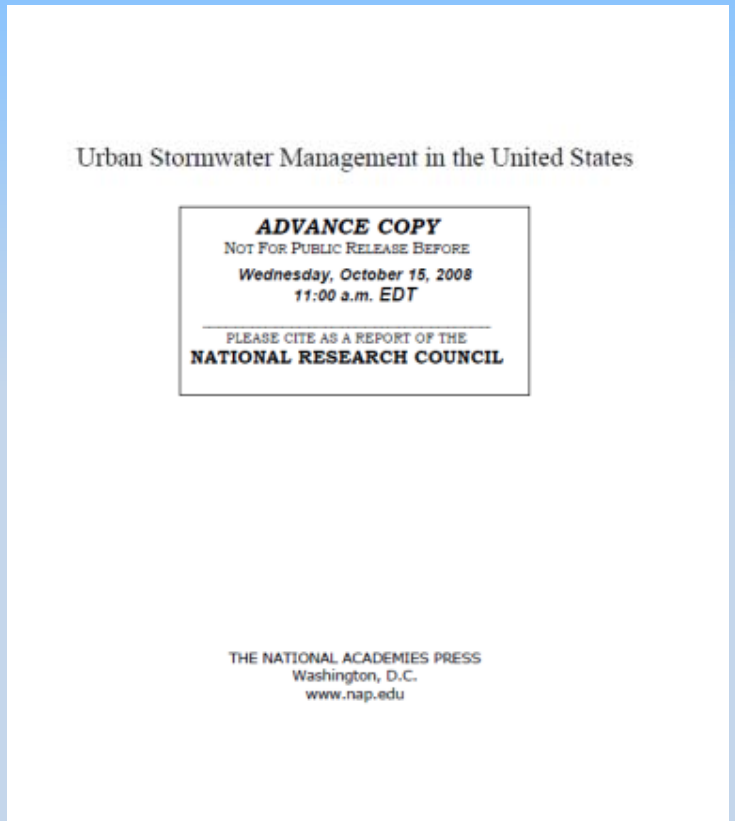
NOT about more regulation
IS about more education
and motivation

MEETING THE CULTURAL CHALLENGE PUBLIC EDUCATION

- ***Pointless Personal Pollution***
  - **www.tappwater.org**
  - **www. floridaagwaterpolicy.com**
  - **http://www.dep.state.fl.us/water/watersheds**
- **Stormwater Education Training tool box (www.stormwater.ucf.edu)**
- **What can YOU do?**
  - **Disconnect roof runoff**
  - **Florida friendly yard**
  - **Pick up pet waste**

NPDES STORMWATER PROGRAM HAS FAILED

- **No surprise to state stormwater managers – can't regulate stormwater as a point source. EPA advised in 1988!**


Urban Stormwater Management in the United States

ADVANCE COPY
NOT FOR PUBLIC RELEASE BEFORE
Wednesday, October 15, 2008
11:00 a.m. EDT

PLEASE CITE AS A REPORT OF THE
NATIONAL RESEARCH COUNCIL

THE NATIONAL ACADEMIES PRESS
Washington, D.C.
www.nap.edu

National Research Council report found many problems with current federal stormwater management regulations

EPA EFFORTS TO IMPROVE MS4 PERMITS TIME LINE

- **November 2007 – DEP begins reissuance of MS4 permits – 3rd cycle – St Pete, Hialeah, Sarasota Co, Hollywood, Orange County**
- **October 2009 - EPA R4 notifies DEP that they will object to draft Hillsborough and Jacksonville permits – drafts withdrawn**
- **EPA sends states draft letter (11/09) and final letter (4/10) with new expectations for MS4 permits**
- **April 10 - EPA issues *MS4 Improvement Guide***
- **Oct 09 – August 10 DEP team negotiates with EPA R4 staff on permit revisions**
- **http://cfpub.epa.gov/npdes/stormwater/rulemaking.cfm**

EPA MS4 PERMIT EXPECTATIONS

- **Increased accountability and measurable permit requirements – enforceability**
- **Focus areas: TMDL implementation, construction sites, post-construction SWM, illicit discharge detection/elimination**
- **Stormwater system inspection, OM**
- **Require written plans, SOPs, schedules, milestones, etc**
- **Antidegradation policy implementation**

INCREASED LOAD REDUCTIONS

PHASE 1 MS4 PERMIT STORMWATER SYSTEM INSPECTION, OPERATION, MAINTENANCE

- **Reformatted table – inspection items, maintenance items**
- **Inspection schedule changed – closer to WMD ERP requirements – can use those recertifications where applicable**
- **Outfalls – annual unless historical records**
- **Pipes, culverts – 10%/yr**
- **Inlets, catch basins, - 20%/yr**
- **EPA wanted ANNUAL inspections**

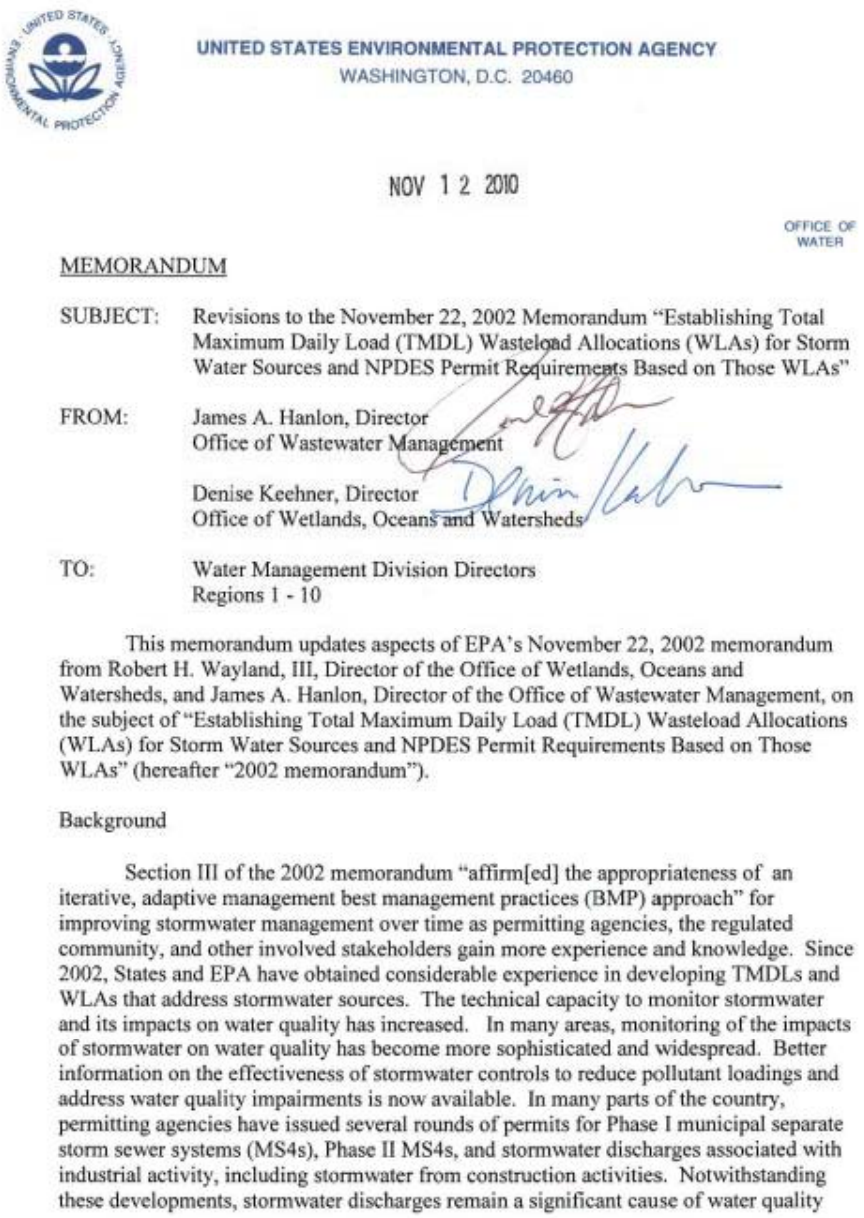
PHASE 1 MS4 PERMIT WRITTEN PLANS, SOPs

- **SWMS inspections, maintenance**
- **Litter control, street sweeping, road repairs, equipment yards, maintenance shops**
- **Municipal waste TSD facility inspections**
- **Education – fertilizers, pesticides, used oil, toxics, illicit discharge reporting**
- **Training – applicators, spill prevention, illicit discharges, site reviews**
- **Inspections - proactive, reactive, high risk industrial, construction**

PHASE 1 MS4 PERMIT TMDL IMPLEMENTATION

- **Fact sheet lists DEP adopted and EPA established TMDLs at time of permit issue**
- **TMDLs with BMAPs – just do it!**
- **TMDLs without BMAPs**
  - **Prioritization report (Months 1–6)**
  - **Monitoring & assessment plan (Months 6-12)**
  - **TMDL outfall storm event monitoring (Months 12-36) – only 1 outfall – EPA wanted ALL**
  - **Supplemental SWMP = TMDL implementation plan (Months 24-48)**
- **Different process for coliform TMDLs**

TMDL IMPLEMENTATION AND MS4 PERMITS



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

NOV 12 2010

OFFICE OF WATER

MEMORANDUM

SUBJECT: Revisions to the November 22, 2002 Memorandum "Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs"

FROM: James A. Hanlon, Director
Office of Wastewater Management

Denise Keehner, Director
Office of Wetlands, Oceans and Watersheds

TO: Water Management Division Directors
Regions 1 - 10

This memorandum updates aspects of EPA's November 22, 2002 memorandum from Robert H. Wayland, III, Director of the Office of Wetlands, Oceans and Watersheds, and James A. Hanlon, Director of the Office of Wastewater Management, on the subject of "Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs" (hereafter "2002 memorandum").

Background

Section III of the 2002 memorandum "affirm[ed] the appropriateness of an iterative, adaptive management best management practices (BMP) approach" for improving stormwater management over time as permitting agencies, the regulated community, and other involved stakeholders gain more experience and knowledge. Since 2002, States and EPA have obtained considerable experience in developing TMDLs and WLAs that address stormwater sources. The technical capacity to monitor stormwater and its impacts on water quality has increased. In many areas, monitoring of the impacts of stormwater on water quality has become more sophisticated and widespread. Better information on the effectiveness of stormwater controls to reduce pollutant loadings and address water quality impairments is now available. In many parts of the country, permitting agencies have issued several rounds of permits for Phase I municipal separate storm sewer systems (MS4s), Phase II MS4s, and stormwater discharges associated with industrial activity, including stormwater from construction activities. Notwithstanding these developments, stormwater discharges remain a significant cause of water quality

- **On our web site**
- **EPA taking comments**
- **Due May 16**

PHASE 1 MS4 PERMIT REPORTING

- **Year 3 Seasonal loadings/EMCs**
  - **Compare loads from major outfalls for past 15 years – TN, TP, TSS, BOD, Zn, Cu**
  - **If no load reduction, explain why not and revise your SWMP to make it more effective in reducing stormwater loads**

PHASE 1 MS4 PERMIT PROGRAM EFFECTIVENESS ANALYSIS

- **Have SW loadings discharged from the MS4 decreased? Why or why not?**
- **Which components of the SWMP are working & effective in reducing SW loadngs?**
- **Which components of the SWMP are not working well & need revised to make them more effective?**
- **Which components of the SWMP do not contribute to reducing SW loads and could be revised or eliminated?**
- **Is the monitoring program providing data that assesses SWMP effectiveness, BMP effectiveness, retrofitting locations?**

TOOLS TO REDUCE STORMWATER LOADINGS

- **Florida-friendly landscaping**
- **Low impact design incentives**
- **Public education**
- **MS4 source reduction project – FSA and UF**
- **FDEP Fecal Coliform Guide**
- **Funding**

2010 FSA WINTER CONFERENCE

Assessing load reduction through MS4 maintenance activities: A DRAFT summary to-date

UNIVERSITY OF FLORIDA
ENVIRONMENTAL ENGINEERING SCIENCES DEPARTMENT
John Sansalone (jsansal@ufl.edu)

1-2 DECEMBER 2010

Project Objective and Outcome

- **To develop a quantitative tool that Florida's MS4s can use to quantify nutrient load reductions achieved through street sweeping and BMP maintenance activities.**
- **Needed to meet MS4 permit requirements of documenting SWMP load reductions and for documenting stormwater load reductions to meet TMDL wasteload allocations**

Participating Florida MS4s

1. Gainesville (GNV) [IN + OUT]
2. Hillsborough County (HC)
3. Jacksonville (JAX)
4. Lee County (LC)
5. Miami-Dade County (MDC)
6. Orange County (OC)
7. Orlando (MCO)
8. Pensacola/Escambia County (PEC)
9. Sarasota County (SAC) [IN + OUT]
10. Seminole County (SEC)
11. St. Petersburg/Pinellas County (SPP)
12. Stuart (ST)
13. Tallahassee (TAL)
14. Tampa (TPH) [IN + OUT]

MCO-CB-R-OUT-2

TPH-BMP-C-OUT-1

HC-CB-R-OUT-2

MDC-BMP-C-OUT-9

JAX-SS-R-OUT-1

ST-BMP-C-OUT-1

Project Process Flow

Initial Sampling Process → **UF Lab Analysis** → **Future Application**

1. The objective is to develop a 'yardstick' to quantify the nutrient load recovered through regular maintenance of BMPs, CBs and sweeping streets.
2. 14 MS4s, each collected 27 samples with detailed field information for every sample.
3. 3 locations each, in 3 land uses – commercial, highway and residential; for the 3 maintenance practices.
4. 3 MS4s also collected 27 samples from within areas with reclaimed water usage, to compare nutrient loads.



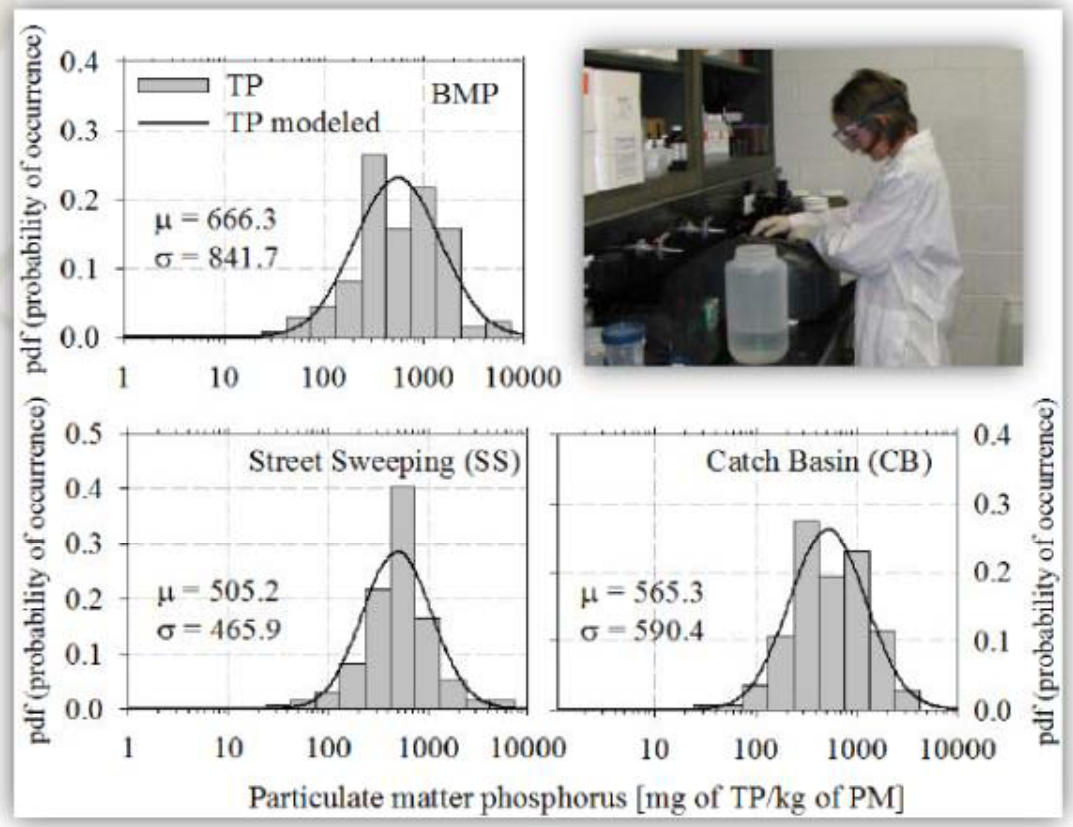





Project Process Flow

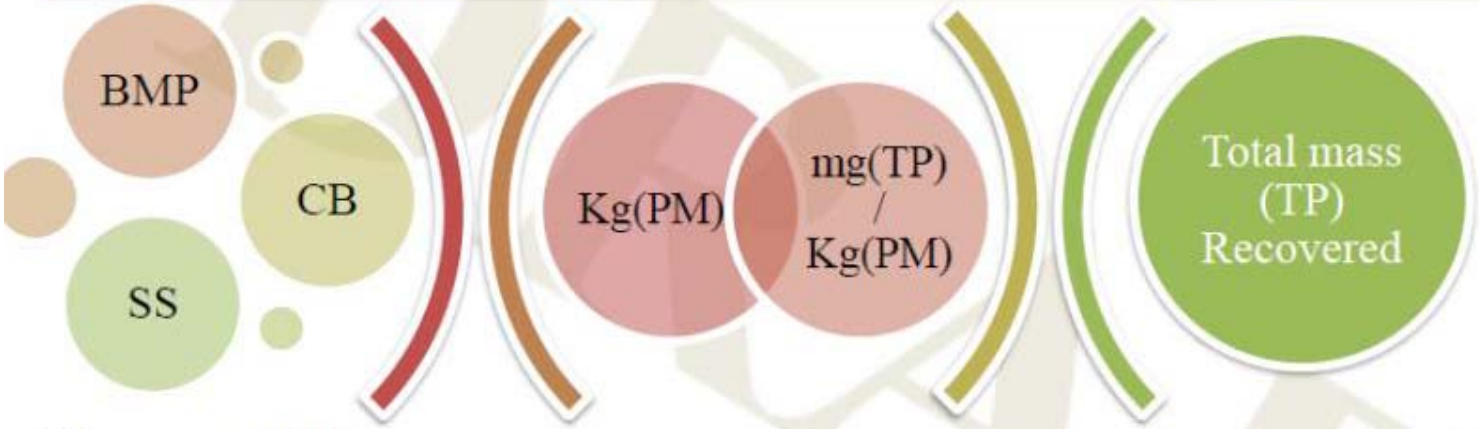
Initial Sampling Process → **UF Lab Analysis** → **Future Application**

1. University of Florida analyzed each sample N and P loadings in their labs.
2. TP, TN, and extractable P, moisture content and particle size distribution analyses were performed.
3. Based on the results, probability distributions were generated for every analyte.
4. Probability analyses show distributions associated with each landuse as well as those associated with each HFU (=BMP).

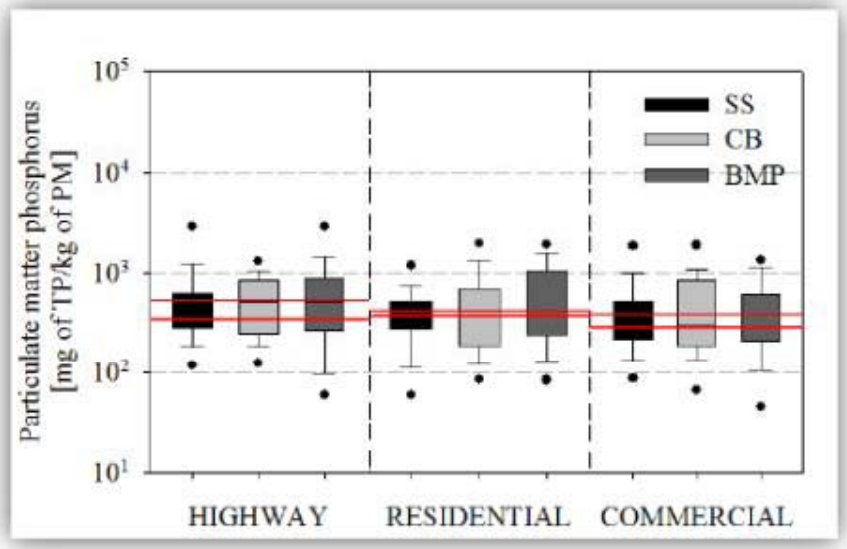


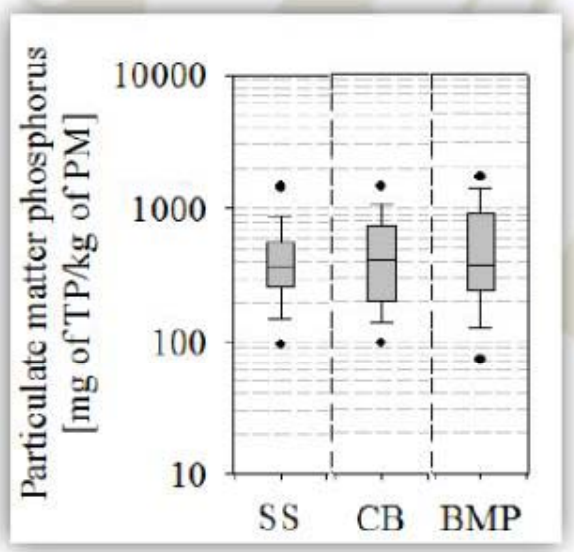
Project Process Flow

Initial Sampling Process → **UF Lab Analysis** → **Future Application**

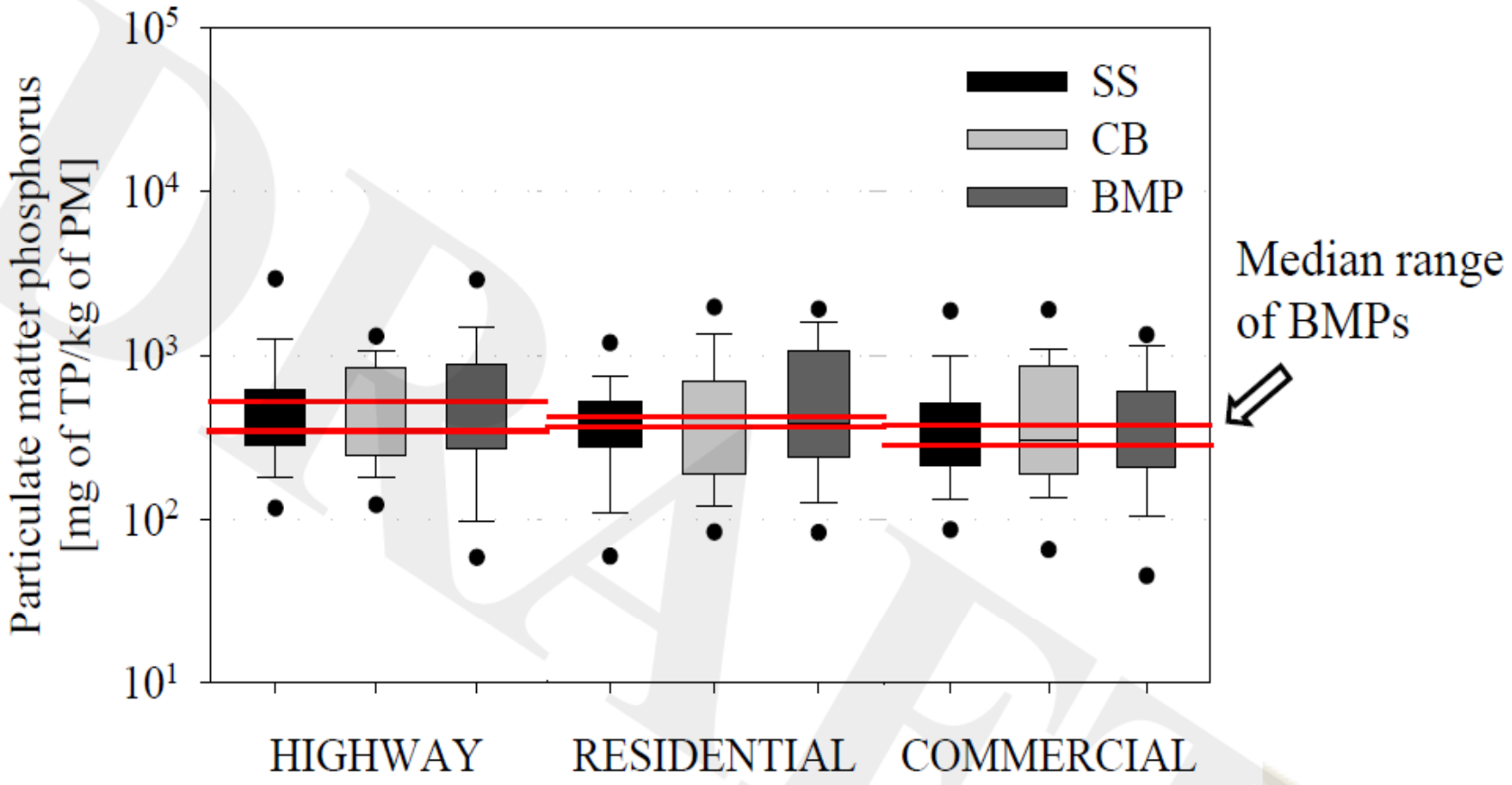


Measure PM **Create 'Yardstick'** **Nutrient Credit**



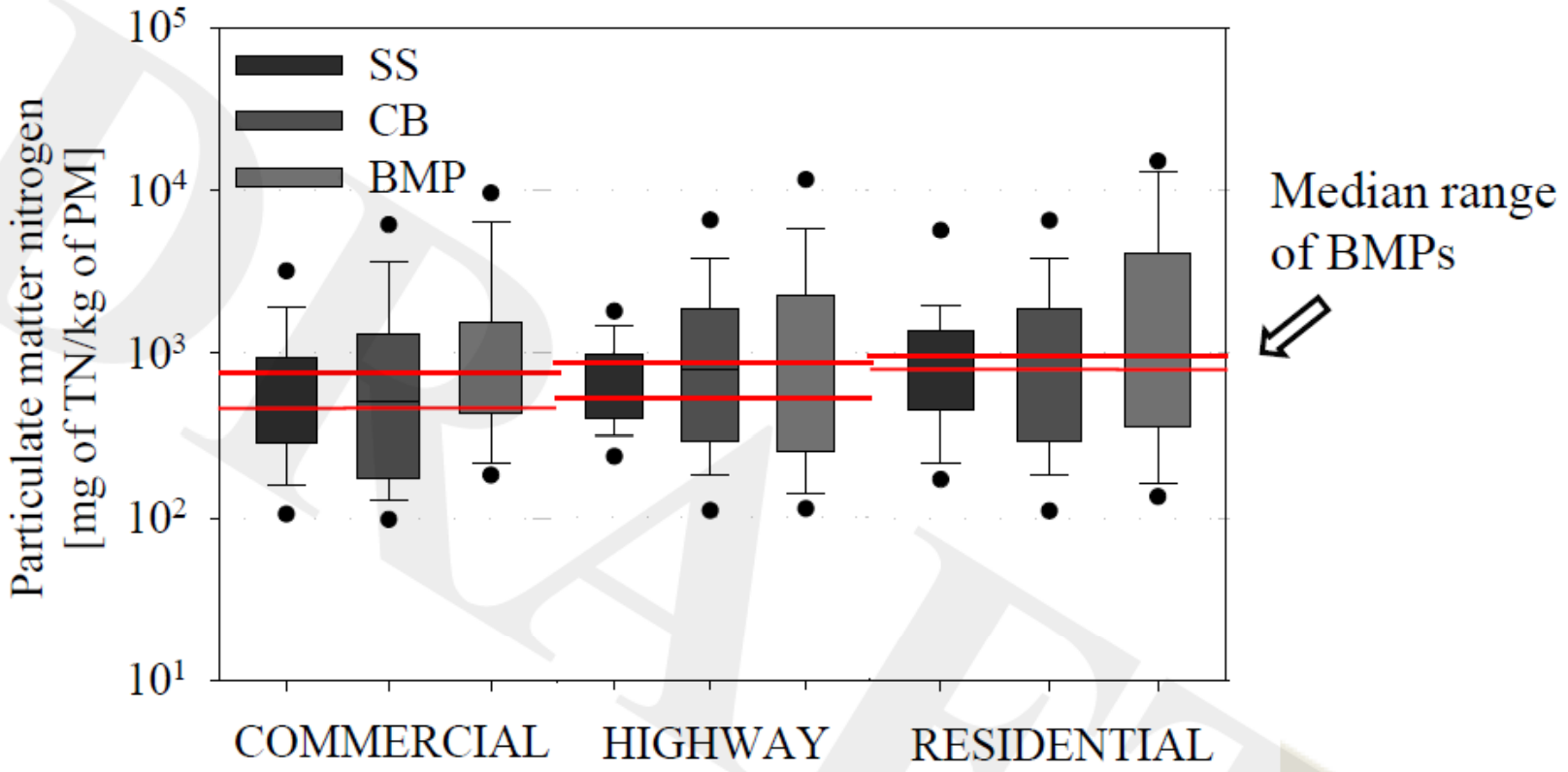


TP Results



TP	Street Sweeping (SS)			Catch Basin (CB)			BMP		
[mg/kg]	Mean	Median	St. Dev.	Mean	Median	St. Dev.	Mean	Median	St. Dev.
C	481.6	384.3	471.5	530.8	300.8	524.9	469.9	290.8	409.0
R	425.7	374.9	284.7	559.1	423.4	543.0	702.8	670.5	382.7
H	619.3	349.7	774.9	560.2	519.3	361.8	755.4	523.1	932.0

TN Results



TN	Street Sweeping (SS)			Catch Basin (CB)			BMP		
[mg/kg]	Mean	Median	St. Dev.	Mean	Median	St. Dev.	Mean	Median	St. Dev.
C	798.3	466.6	864.1	1854.7	756.6	2838.6	1332.4	513.6	2077.8
R	1331.0	793.0	2030.5	3592.6	978.8	5055.1	1730.7	801.1	2812.3
H	775.5	527.6	632.7	2146.2	874.8	3233.0	1727.6	789.4	2388.5

Project Process Flow - Calculations

Initial Sampling Process → **UF Lab Analysis** → **Future Application**

BMP

CB

SS

Kg(PM)

mg(TP) / Kg(PM)

Total mg(TP) Recovered

Measure PM | **Create 'Yardstick'** | **Nutrient Credit**

City of Stuart

ST-SS-R-2

600 kg PM recovered

0.5 lane miles swept

TP Yardstick

Street Sweeping – Residential Landuse Yardstick

Mean = 425.7 mg TP / kg PM

Nutrient Recovery

TP recovered = 600 kg PM * 425.7 mg TP / kg PM

255.42 g TP recovered

500.82 g TP / lane mile

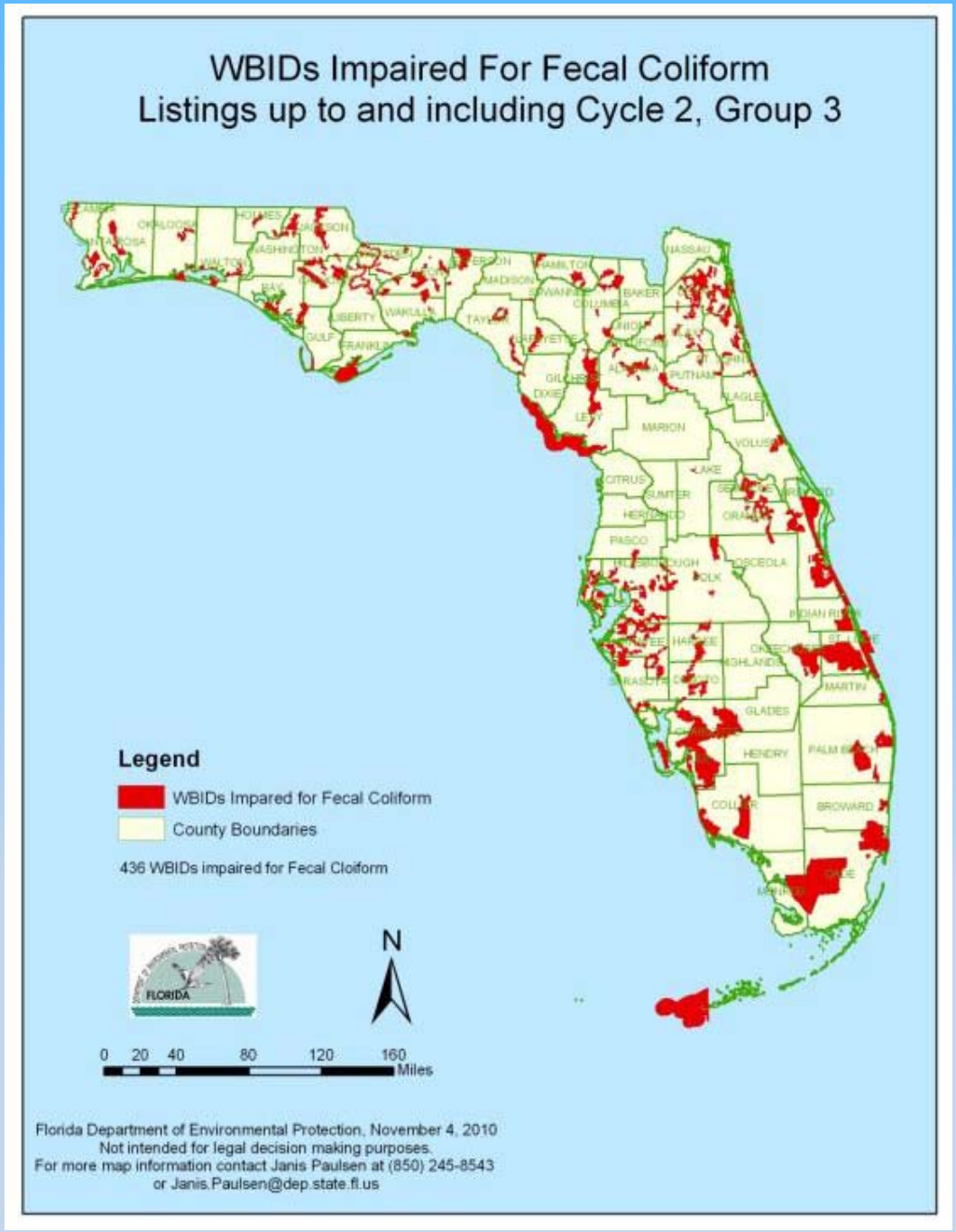
DEP FECAL COLIFORM TOOL BOX FOR REDUCING LOADS

AMY TRACY

BMAP COORDINATOR

FDEP

Verified Impairments for Fecal Coliforms in Florida



FECAL COLIFORM ISSUES

- **Used as an indicator organism for human pathogens – public health issue**
- **NOT a good indicator of risk**
- **A new water quality standard using other indicator organisms is being developed by EPA**
- **Even if there are non-human sources, some in the public may not want to recreate in these waters**

SOURCE IDENTIFICATION

- **This is the primary difficulty –**
- **Impairment may be based from a small amount of data and/or from a very small number of sampling stations in the WBID**
- **Other difficulties tying F.C. to pathogens:**
  - **Salinity in tidally influenced areas**
  - **Impacts of coliforms in resuspended sediments**
  - **Regrowth of bacteria rather than new source**
  - **Don’t differentiate between human, livestock and wildlife**

GENERAL SOURCES

- **Structural Sources – sanitary sewers, lift stations, illicit discharges, septic tanks**
- **Pet Wastes**
- **Other Land Use Sources – agriculture, marinas**
- **Sources difficult to control – wildlife and homeless**

HOW BEST TO IMPLEMENT THE FECAL COLIFORM TMDL?

- **Develop a formal BMAP?**
- **Local effort *****
- **Either way, the process primarily involves detective work**
- **There are a number of tools that be used**
- **The cost of source identification will vary depending on the number and type of tools you implement**

HOW CAN WE HELP?

Implementation Guidance for the Fecal Coliform Total Daily Maximum Loads Adopted by the Florida Department of Environmental Protection

developed by the
Florida Department of Environmental Protection
Division of Environmental Assessment and Restoration
Bureau of Watershed Restoration
Tallahassee, FL 32399

March 2011

CONTENTS OF THE GUIDANCE DOCUMENT

TABLE OF CONTENTS

CHAPTER 2 UNDERSTANDING THE BASIN

- **2.1 Using the TMDL Report**
- **2.2 Compiling and Evaluating Data**
- **2.3 Identifying the Responsible Stakeholders**
- **2.4 Coordinating with FDEP**

DECISION MATRIX

- **Can be used to determine prioritization for attacking fecal coliform impairments – both need for additional monitoring and management actions**
- **Involves assessing level of fecal impairment and contaminant sources**
- **Match together in a matrix to identify potential risk**

DECISION MATRIX (cont.)

		MWQA group (based on binomial assessment of frequency of 400 CFU/100 mL fecal coliform exceedances)					Exceptional Circumstances (e.g., sewer line break)[c]
		A (≤ 10%)	B (>10% - 30%)	C (>30% - 50%)	D (>50% - 75%)	E (>75%)	
Contaminant source survey (CSS) assessment category (likelihood of fecal contamination posing human health risks)	1. Very Low	A1	B1	C1[a]	D1[a]	E1[a]	**Immediate Action**
	2. Low	A2[b]	B2	C2	D2[a]	E2[a]	
	3. Moderate	A3[b]	B3	C3	D3	E3	
	4. High	A4[b]	B4[b]	C4	D4	E4	
	5. Very High	A5[b]	B5[b]	C5[b]	D5	E5	
Exceptional Circumstances (e.g., sewer line break)[c]		**Immediate Action**					

Site Classification Matrix
(based on WHO "Annapolis protocol" approach)

CHAPTER 3 POTENTIAL SOURCE IDENTIFICATION

- **3.1 Sources of Fecal Coliform**
- **3.2 Tools for Source Identification**
- **3.2.1 *Walk the Waterbody Process***
- **3.2.2 *Decision Matrix and Ranking Tool***
- **3.2.3 Source identification**
- **3.2.4 Pollution Assessment**
- **3.2.5 State of Oregon Implementation Matrix Template**
- **3.2.6 Wildlife Surveys**
- **3.3 Evaluating Data Sufficiency**
- **3.4 Coordinating with FDEP**

WALK THE WATERBODY

- **The Walk the Waterbody exercise is an important first step in determining fecal coliform sources entering an impaired waterbody and identifying easy-to-implement management actions.**
- **It uses existing programs and ongoing activities to remove the most obvious sources and identifies uncertainties and future options for more effective adaptive management.**

WALK THE WATERBODY (cont.)

- **In the Walk the Waterbody exercise, a team walks along the banks of the impaired waterbody and its contributing waters to identify potential sources of fecal coliform contamination as well as other issues that may be affecting water quality.**

WALK THE WATERBODY (cont.)

- **This field reconnaissance is carried out to gain a better understanding of conditions in the watershed—including the hydrology of the waterbody and its contributing ditches and branches, the locations of flood-prone areas, and the locations of sewer and stormwater.**

CHAPTER 4 MANAGEMENT ACTIONS

- 4.1 Projects and Activities
- 4.1.1 Structural Activities
- 4.1.2 Nonstructural Activities
- 4.2 Project Selection Process
- 4.2.1 Summary of Potential Sources and Management Actions
- 4.2.2 Evaluation of Management Actions
- 4.3 Coordinating with FDEP

APPENDICES

- **Training manuals for walk the waterbody exercises and examples from previous efforts**
- **Other documents and case studies providing more detailed information on strategies described in main guidance document**

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Guidance document is available at:

http://www.dep.state.fl.us/water/watersheds/bmap.htm

STORMWATER/WATERSHED MANAGEMENT: FINANCIAL CHALLENGES

Big Money Problem

Dedicated Funding is the Key

FLORIDA FUNDING SOURCES

- **Stormwater utility fees**
- **Stormwater program fees**
  - **Plan review**
  - **Inspections**
  - **Operating permits**
- **State Revolving Fund**
- **SWIM, WMD Coop Programs**
- **Section 319 NPS Grants**
- **TMDL WQ Restoration Grants**

REVISING YOUR SWMP TO FOCUS ON TMDL LOAD REDUCTION

Edward Smith

FDEP

IT IS YOUR SWMP

- **The SWMP is <u>YOUR</u> SWMP**
  - **BMPs submitted by MS4**
  - **Approved by FDEP**
  - **Take ownership – they are your community's waters**

DUTY TO COMPLY

- **Part V.A of the Generic Permit [62-621.300(7)a]**
  - **Requirement to assess and adjust SWMP**
- **Part V.B of the Generic Permit**
  - **Requirement to review SWMP upon development of a TMDL**
  - **SWMP must meet TMDL allocation**

LIKELY TMDL REQUIREMENTS

- **MS4 inventory – outfalls, basins, land uses, loadings**
- **Source controls**
  - **Florida-friendly landscaping**
  - **Low impact design**
  - **Street sweeping**
- **Structural controls**
  - **Retrofitting projects**
  - **Floating wetlands**

THE PROCESS

- **Review Your SWMP**
- **Submit a new NOI**
  - **Add new BMPs**
  - **Replacing exisiting BMPs**
- **Implement BMPs**
  - **Upon approval from FDEP**

Questions

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Participation Certificate

- If you would like to obtain participation certificates for multiple attendees, copy the link below into your web browser.

- You can type each of the attendees names in and print the certificates

http://www.epa.gov/npdes/webcasts/certificate/stormwater_fl.pdf